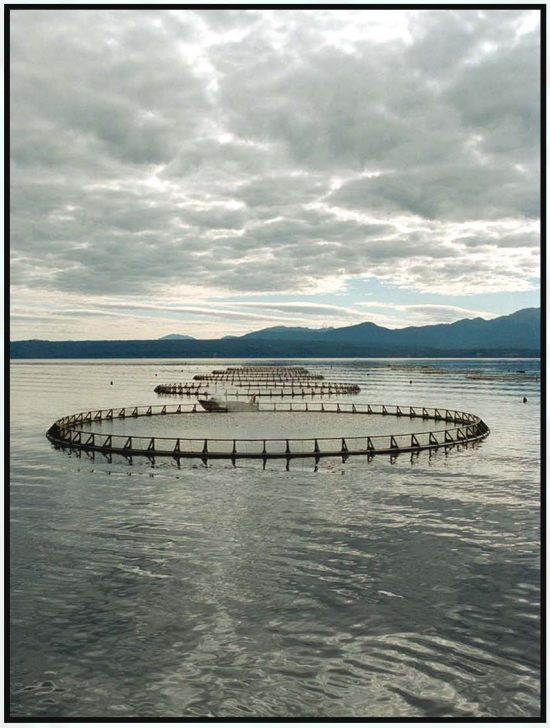
Interactive governance, interorganisational cooperation and property rights:

Explaining the development of the salmon sector in Chile



Thesis for the Master of International Development Studies

By

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Preface

In September 2000 I started with my study 'International Development' at Wageningen University and Researchcentre. The first experience 'in the field' was a two week practicum in Ireland in 2002. The purpose of this practicum was to try and experiment with different methods and techniques to do research in social sciences. The topic that I chose was Integrated Coastal Zone Management; an experiment that took place in Clew Bay, county of Mayo. A number of complex problems, such as pollution and diseases in aquaculture, ignited the initiative to start cooperation between public and private parties, with the aim of solving these complex problems. Salmon producers in Clew Bay faced more problems than pollution and diseases alone; they also faced increasing competition from Chilean salmon producers.

The short experience with Integrated Coastal Zone Management in Ireland was enough to fascinate me in two ways. The first interesting issue was the public-private cooperation as a way to solve complex problems. The second interesting issue was the booming salmon sector in Chile. During 2006, I finally had the chance to elaborate these ideas into a more concrete research proposal, together with my supervisor Ab van Eldijk from the chair group 'law and governance'. After six weeks of brainstorming, it became clear that the research was going to concentrate on explaining the fast and sustained development of the salmon sector in Chile; the report that you are reading right now is the final result of this research and serves as a thesis for my study.

The research lasted from November 2006 until August 2007, including the execution of interviews in Chile between January and June 2007. The research in general and more specifically my stay in Chile would not have been possible without the cooperation and help of many persons, both directly as indirectly.

I would like to thank Gustavo Blanco for helping me to elaborate my ideas into a more concrete research proposal and for his advice during the research. Furthermore, I would like to express my appreciation for the friendliness and warmth of Abraham Soto Zamora and his parents Raul Soto and Sonia Zamora, during the time that I lived in Santiago. Jorge Katz also helped me in a great manner by giving useful feedback to the questions I had in the early stages of the research. Many thanks to Veronica Rocco, for her great help during the time I spent in Puerto Montt. Furthermore, I am grateful for the hospitality of Mauricio Osorio and Malin Nilsson during my stay in Puerto Varas. Marcelo Valenzuela Alfaro also helped me in a great manner by giving feedback to my questions on aquaculture concessions; moreover, he was an excellent host during our meeting in Viña del Mar. Credits go out to Jorge Bermúdez, for advising me on the legal aspects in relation to salmon cultivation, and for bringing me in contact with experts from the Sub-secretariat of Fishery. Many thanks to my supervisor Ab van Eldijk, for his fantastic enthusiasm, inspiration, feedback and advice during the entire research. My friends and family also helped wonderfully, foremost by keeping in touch during the six months that I was in Chile. Lastly, I am specifically grateful to my parents Cor and Monique, who keep on supporting me in many ways and under all circumstances.

Wageningen, August 2007

Bas Bolman

Summary

Within 25 years, the salmon sector in Chile has grown more than 3,500%, generating employment for more than 50,000 people. The sector generates approximately US$ 2 billion per year and is the fifth largest in the country. Nowadays Chile is the second largest producer of salmon, just after Norway (FAO, 2005b).

It is clear that the salmon sector has shown a fast and sustained development during the last 25 years. Moreover, the salmon sector is not an isolated example of a successful export sector; other sectors such as the wine, timber and fruit sectors show similar trends. This long-term and structural economic growth has become known as the Chilean Miracle. The neoliberal policies of the last 25 years are often referred to as the main explanation for the Chilean Miracle, the successful growth of new export sectors, and the salmon sector.

This thesis aims to find the crucial factors that can explain the fast and sustained development of the salmon sector. At the same time, it critically analyses the assumption that neoliberal policies are the key explanation for the development of this sector.

The search for answers that can explain the development of the salmon sector in Chile starts more than 40 years ago. Four decades ago, the Chilean economy faced a structural economic problem. Copper was by far the most important industrial sector of the country. This implied that Chile's economy was very vulnerable to fluctuating world copper prices.

During the 1960s and the beginning of the 1970s the presidents Frei and Allende introduced import substitution industrialisation and a nationalisation programme as the solution for this problem. Their aim was to develop domestic industries and an internal market, in order to protect the Chilean economy. Due to this strategy, new problems arose. The nationalisation of industries and banks and the expropriation of agricultural land caused national productivity to decline; moreover, it caused polarisation between many groups in the Chilean society.

The consequence was an economical crisis in 1973, which was used by General Pinochet to take over power. However, the military regime recognised the same structural problem in the Chilean economy. The regime introduced a 'radical' neoliberal model, under which new natural resource based export sectors had to develop. This implied a small but strong state that interfered as less as possible with the functioning of the free market. The private sector had serious problems to adapt to this strategy; in addition, they were expected to create new export sectors with very little assistance of the government.

The radical neoliberal programme resulted in another economical crisis in 1982. The military regime shifted its strategy, and adopted a more pragmatic neoliberal programme. Through interactive governance, the Chilean government coordinated and later facilitated public-private partnerships to jointly deal with the challenge of creating new export sectors. Through strategic interorganisational cooperation, characterised by the shifting roles of coordinating organisations, the opportunities were utilised to build up new sectors such as the salmon sector. Due to the interaction between public and private parties, a regulatory framework for aquaculture evolved that provided a clear legal scope for the further development of the salmon sector.

The combination of these historical developments resulted in the fast and sustained development of the salmon sector, together with the development of other natural resource based export sectors. The dependency of the Chilean economy on fluctuating world copper prices decreased significantly due to these new export sectors. The structural economic growth of the last two decades that resulted from this process of trial and error is what we now know as the Chilean Miracle.

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List of abbreviations

AAA	–	Áreas Apropiadas para el ejercicio de la Acuicultura
APEC	–	Asia-Pacific Economic Cooperation
CONAMA	–	Comisión Nacional del Medio Ambiente
CORA	–	Corporación de la Reforma Agraria
CORFO	–	Corporación de Fomento
DIRECTEMAR	–	Dirección Gen. de Territ.Marítimo y de Marina Mercante
FAO	–	Food and Agriculture Organization
FDI	–	Fondo de Desarrollo e Innovacion
FONTEC	–	Fondo Nacional de Desarrollo Tecnologico y Productivo
FPE	–	Fondo de Promoción de Exportaciones
FTAA	–	Free Trade Area of the Americas
GDP	–	Gross Domestic Product
HACCP	–	Hazard Analysis and Critical Control Points
IDB	–	Inter-American Development Bank
IFOP	–	Instituto de Fomento Pesquero
IMF	–	International Monetary Fund
INTESAL	–	Instituto Tecnológico del Salmón
ISI	–	Import Substitution Industrialisation
ITQ	–	Individual Transferable Quota
ITT	–	International Telephone & Telegraph Corporation
JICA	–	Japanese International Cooperation Agency
LBMA	–	Ley de Bases del Medio Ambiente
LGPA	–	Ley General de Pesca y Acuicultura
MERCOSUR	–	Mercado Común del Sur
NAFTA	–	North American Free Trade Agreement
NGO	–	Non Governmental Organisation
ODEPA	–	Oficina de Estudios y Políticas Agrarias
ODEPLAN	–	Oficina de Planificación Nacional
PNA	–	Política Nacional de Acuicultura
ProChile	–	Dirección de Promoción de Exportaciones
PROFO	–	Proyectos de Fomento
SAG	–	Servicio Agrícola y Ganadero
SEIA	–	Sistema de Evaluación de Impacto Ambiental
SERNAPESCA	–	Servicio Nacional de Pesca
SERPLAC	–	Secretaría Regional de Planificación y Cooperación
SHOA	–	Servicio Hidrográfico y Oceanográfico de la Armada
SUBPESCA	–	Subsecretaría de Pesca
UN	–	United Nations
UNCTAD	–	United Nations Conference on Trade and Development
UNDP	–	United Nations Development Programme
WTO	–	World Trade Organisation

See the glossary on page 96 for the translation of Spanish words.

Chapter one

Introduction of the thesis

The salmon sector in Chile has shown an impressive growth since commercial production started 25 years ago. In this relatively short time span, a salmon cluster has arisen that provides jobs for more than 50,000 persons, generating approximately US$ 2 billion per year. Nowadays, the sector has become the fifth largest in the country. Considering the international position of Chile in the ranking of salmon producers, the country is the second largest producer, just after Norway (FAO, 2005b).

The fast and sustained development of the salmon sector is not an isolated example if one analyses the economic development of Chile through the last decades. Several other new export sectors have developed during the same period, that are also based on the utilisation of natural resources. Examples include the wine, fruit and timber sectors. This long-term and structural economic growth has become known as the 'Chilean Miracle'.

There are many publications that try to explain the Chilean Miracle. Many of these publications conclude that the neoliberal policies must be regarded as the key explanation in order to understand Chile's structural economic development.

This thesis aims to find the crucial factors that can explain the fast and sustained development of the salmon sector. At the same time, it critically analyses the assumption that neoliberal policies are the key explanation for the development of this sector.

The following chapters will contribute to research which crucial factors have influenced the development of the salmon sector.

In chapter two the subject of this thesis is further elaborated, including the statement of the problem and the research questions. In chapter three the theoretical framework is presented, that assists in answering the research questions. This framework consists of a triangle of three theoretical perspectives, which are the interaction in development through governance, the participants in development through organisations, and the institutions of development through property rights. Chapter four deals with the methods and techniques of the research. This chapter explains how the research was executed, where the research took place, and who was interviewed. Chapter five describes some developments of worldwide aquaculture, and the production process of salmon. The chapter assists in placing the Chilean case into a broader worldwide perspective. In chapter six, the thesis zooms in on the salmon sector in Chile. It describes the relevant historical developments that contributed to the growth of the sector. In chapter seven, the Chilean Miracle is further investigated. This is done by exploring the influence of governance processes on economic growth in the last four decades. This chapter assists in placing the development of the salmon sector in a broad economical and political context. In chapter eight, the thesis concentrates on individual organisations and the interaction between organisations, and how these organisations contributed to the development of the salmon sector. Chapter nine focuses on the development of the regulatory framework for aquaculture and the concession system. The chapter also analyses how the regulatory framework and the concession system influenced the development of the sector during the last 25 years. In chapter ten, a review is presented, the research questions are answered, and the final conclusions are drawn. The last chapter offers a look into the future by giving some recommendations for the further development of the salmon sector.

Chapter two

Statement of the problem

2.1 Introduction

In this chapter we are going to explain what the purpose is of this research, in order to lay the foundations for the continuing chapters. The aim of this chapter is to explain the subject of this thesis.

First, we will look at the statement of the problem, so we can identify the reasons for doing this research. It will become clear that the overarching theme of this thesis focuses on how to explain economic growth. The Chilean Miracle is a well-known example of long-run economic growth. With this study we will zoom in on a highly successful example of this Miracle, which is the fast and sustained development of the salmon sector. As the section will make clear, the existing explanations for the Chilean Miracle and the development of the salmon sector leave a number of questions unanswered. After we have explained the origin of this research, we will make the step towards converting the statement of the problem into concrete research questions. Finally, the chapter ends with some general observations.

2.2 Explaining economic growth

In 1982, the influential economist and Nobel Prize winner Milton Friedman announced Chile to be 'an economic miracle'. Having his roots in the University of Chicago, Friedman has been known to have a strong preference for neoliberalism, implying a small but strong state that interferes as less as possible in the free market. This neoliberal model had been adopted in 1973 by General Pinochet's military regime, which was advised by a group of economists. Many of these economists were educated at the University of Chicago, inspired among others by Friedman. Therefore, this group of economists soon became known as the 'Chicago Boys' (Cypher, 2004).

Until today, Friedman's statement has been copied by many other politicians and scholars, referring to the successes of the 'Chilean Miracle'. This implies that almost all of them directly relate the Chilean Miracle with neoliberalism. In other words, the factors of success that explain the economic growth in Chile over the last 25 years are assumed to have an explicit and direct link with the free market system in this country.

A significant contribution to this economic growth was realised through the creation of new export sectors during the military regime of 1973-1990. The regime was convinced that the Chilean economy was too dependent on copper as an export product. This implied that the Chilean economy was very vulnerable to fluctuating world copper prices. To deal with this, a strategy of export diversification was introduced. Especially in the 1980s, this resulted in a booming of natural resource related sectors, such as the wine, timber and salmon sectors.

Over the years, the latter sector has shown the most impressive growth. The production of Atlantic salmon – the dominant cultivated specie – increased from 10,000 to 350,000 metric tonnes between 1990 and 2004, implying a growth of 3,500% in 14 years. In the south of Chile, in Region X, a cluster has arisen, providing 50,000 jobs and generating almost US$ 2 billion per year. Nowadays, Chile is the second producer of salmon in the world, just after Norway (FAO, 2005b).

The question arises which factors can explain this fast and sustained. A diversity of different scientific articles makes clear that these factors can be divided in four categories[1]:

Natural resources
- Moderate temperature, high oxygen, suitable salinity and purity of ocean water
- Abundance of space on the right altitude (41-55°S)
- Accessibility of resources for the production of fish meal and oil

Human resources
- Availability of skilled and low wage labour for plants (10 times cheaper than Norway)
- Availability of entrepreneurial and high-educated professionals

Production and infrastructure
- Cheap smolt production
- Vicinity and availability of services and materials through the salmon cluster
- Well developed infrastructure (airport, seaport, roads, electricity, telecommunication etc.)

Legal, economical and organisational aspects
- A variety of free trade agreements (e.g. APEC, NAFTA, MERCOSUR)
- Favourable exchange rate policy between 1984 and 1990
- Liberal macroeconomic policies
- Coherent organisational, administrative, economical and legal framework
- Very low level of corruption

The factors of success that are generally accepted as being most influential are neoliberalism, natural resources, and cheap labour.

From a neoliberal viewpoint, the explanation for the Chilean Miracle – mentioned above – including the fast and sustained development of the salmon sector, is attributed to the functioning of the free market, in combination with a strong but small state that interferes as less as possible with this free market. The neoliberal theory assumes that businesspeople will accept high financial risks and invest in an undeveloped sector, even when this sector is neither efficient, nor competitive, and not yet profitable. Lastly, the theory also assumes that these businesspeople are continuously aware of new opportunities and that they see the potential of undeveloped sectors to become successful.

From a natural resource based viewpoint, the explanation for the fast and sustained development of the salmon sector is attributed to the fact that Chile has an abundance of space on the right altitude. However, there are plenty of other countries that have the same geographical conditions for the cultivation of salmon. Yet, Chile is the only country in the world with a booming salmon sector. Favourable geographical characteristics are an important condition for making salmon cultivation possible; however, these characteristics do not explain why the salmon sector arose in Chile, and why it developed so fast.

The perspective of cheap labour, as an explanation for the fast and sustained development of the salmon sector, essentially confronts us with the same obstacle as the natural resource based perspective. Labour costs are approximately 10 times lower compared to Norway. This implies that the cheap labour factor is an important aspect that strengthens the competitiveness of the salmon sector; however, it does not explain why the salmon sector could develop so fast.

[1] These explanations are based on: ISB Research, 2005 in G&A, 2006:37; G&A, 2006:v-26; USDL, 2005 in G&A, 2006:16; Maggi Campos, 2004:3; Pietrobelli & Rabellotti, 2004:86-87; Niklitschek *et al.,* 2005:5; SUBPESCA, 2003:73.

This short analysis of three dominant perspectives to explain the development of the Chilean salmon leads us to some important remarks. First, the perspectives of natural resources and cheap labour are only useful in a very limited manner in order to understand the development of the salmon sector. These characteristics are present in tens of other countries in the world; thus, they do not explain why the salmon sector became successful in Chile. Second, the perspective of neoliberalism assumes that governments have a distorting influence on the functioning of the free market. This implies that the perspective also assumes that the private sector is capable to build up new sectors independently and without any incentives. The question arises if this is indeed applicable to Chile. Therefore, it is necessary and useful to critically analyse this causal relationship again. Nevertheless, a critical analysis of the influence of neoliberal policies in Chile, in relation to economic growth in general and the salmon sector in specific, is not sufficient. We also need to focus our exploration on other possible explanations for the development of the salmon sector.

The existing literature offers three other possibly useful perspectives, which are mentioned on the previous page in the fourth category. These perspectives are governance, organisational issues, and the legal framework.

However, these perspectives are not worked out in much detail. For example, how has governance during the last 40 years contributed to the development of the salmon sector?

The organisations that contributed to the development of the salmon sector have been analysed in the literature. However, most articles are focussing on the contribution of separate organisations, but they do not consider the aggregate value of the cooperation among these organisations.

Lastly, the coherency of the legal framework has been claimed to explain why the development of the salmon sector went so fast. Again, there are no scholars that explain this in more depth. Crucially, they have not looked at how property rights, and more specifically user rights, influenced this development. And what about the zoning of the coastal areas in Chile – the operationalisation of user rights – what effects did this have on the development of the salmon sector?

2.3 Research questions

The statement of the problem, as described above, can be converted into a number of concrete research questions. The following questions will serve as our guidelines throughout the thesis:

Main research question:
Which factors can explain the fast and sustained development of the salmon sector in Chile?

Sub questions:
- How did governance affect the development of the sector through time?
- Which organisations have contributed to the development of the sector through time?
- How did these organisations influence the development of the sector through time?
- How did the cooperation between organisations contribute to the development of the sector through time?
- How has the system of user rights developed through time?
- How has the system of user rights influenced the development of the sector through time?

2.4 Review of the chapter

The central theme of this research is explaining the economic growth in Chile in the last 30 years. In broad terms, the Chilean Miracle is a highly successful example of economic growth; more specifically, the salmon sector is one of the crucial sectors contributing to economic growth in Chile. Within 25 years time, Chile managed to become the second salmon producer in the world, generating almost US$ 2 billion per year, and employing more than 50,000 people.

The Chilean Miracle and the development of the salmon sector are commonly claimed to be the result of neoliberal policies over the last 25 years. This approach assumes that governments have a distorting influence on the functioning of the free market and that the private sector is capable to build up new sectors independently and without any incentives. This thesis will critically analyse the causal relationship between neoliberal policies and the development of the salmon sector, as a crucial part of the broader Chilean Miracle. Moreover, we will analyse how the development of the salmon sector is influenced through time by governance, interorganisational cooperation, and user rights, as a form of property rights.

Chapter three

Theoretical framework

3.1 Introduction

In the foregoing chapter, it was explained that the main topic of this research is explaining the development of the salmon sector in Chile. In this chapter, a theoretical framework is presented. The aim is to elaborate the theories that can assist in answering the research questions. We will concentrate on three broad perspectives; the interaction in development through governance, the participants in development through organisations, and the institutions of development through property rights.

As we will explain below, the combination of these three elements form a 'theoretical triangle' in which the elements inextricably interact with each other. However, due to the fact that this chapter focuses on theoretical aspects, we are not yet applying theory with practice. It is important nevertheless, to inform the reader that the theory on governance relates to chapter seven, the theory on strategic interorganisational cooperation corresponds to chapter eight, and the theory on property rights is connected with chapter nine. After that, in chapter ten, we will apply the presented theory in this chapter to the sector analysis of the chapters seven, eight and nine.

The chapter is organised as follows. The first sections deals with interactive governance. We will define interactive governance and describe the characteristics of interactive governance so we can understand how interactive governance processes can be analysed. After that we will look at the causal relationships between interactive governance and economic growth. Lastly, we will zoom out again to review the section. The second section concentrates on how actions and interactions of organisations can influence the growth of sectors. Like the first section, we will first define what an organisation is. Then, we explain what the characteristics are of organisations, and which types of organisations can be distinguished. The section continues with the causal relationship between strategic interorganisational cooperation and economic growth. We finish by zooming out once again, and review the section on organisations. In the third section, we will deal with property rights. We will define property rights, look at several characteristics, and describe the types of property rights that are important for the subject of this thesis. Then, we will relate property rights with economic growth, and we will end by zooming out and review the section on property rights. The chapter finishes with a review of the theoretical framework.

3.2 Interaction in development – governance

What is governance?

To understand the concept of governance, we first have to look at what the concept exactly means. Governance is a popular concept, interpreted in different manners, used in different situations. Moreover, there is a variety of different definitions of governance.

According to Jessop, this concept has its roots in classical Latin and ancient Greek languages, meaning so much as 'the steering of boats'. Originally, it referred to the action or manner of governing, guiding or steering conduct (Jessop, 1998:30). However, as Bavinck *et al.* state, this metaphor has become somewhat old-fashioned. They make a critical point, by remarking that 'the state creates the illusion of setting goals, in practice this is done in interaction with societal parties' (Bavinck *et al.,* 2005:43). Apparently, the notion of governance as being rather static and top-down is challenged by some scholars, who regard governance as being dynamic and interactive.

Another remark needs to be made on the difference between government and governance, because they are often used intertwined (Plumptre & Graham, 1999:1-2). There is an

important difference between the two. This difference lies in the fact that governance is always part of a government, but governance is not applicable only to government.

The new notion of governance with interaction as the central theme – implying that governance is not only applicable to the public sector, but also to the private sector and civil society – assist us in choosing a useful definition of governance:

> The intentional interaction between and within organisations and institutions (derived from Kooiman, 1999:70)

The next question that arises is what we mean by organisations and institutions. An organisation can be defined as:

> Structural cooperation between a group of individuals to achieve one or more common goals (derived from Princeton University, 2006).

Considering the concept of institutions, the definition of North (1990:3) helps us to construct the following definition:

> Institutions are formal and informal rules that shape human interaction.

When we combine these concepts, it becomes clear that one way to approach governance is to regard it as the intentional interaction between and within groups of individuals that structurally cooperate to achieve one or more common goals; the scope within these goals can be achieved is determined by formal and informal rules. As a consequence, we will continue this section by exploring the concept of 'interactive governance', as has been developed by Kooiman[2].

Characteristics of interactive governance

Since we have chosen for an interactive governance approach, we will now look at the characteristics of this concept.

Kooiman argues that interactive governance can be divided into three interrelated categories, or 'governance orders'. First order governance consists of what participants in governance processes generally do, namely solving problems and creating opportunities. This is a day to day activity between individuals and groups in societies, in which interaction is the central characteristic. Note that there is a strong link with the earlier mentioned definition of organisations, which are characterised by cooperation and achieving common goals. Second order governance focuses on the maintenance and design of formal institutions that are necessary to solve problems and create opportunities. Thus, the second order is about shaping the scope in which first order governance can take place, through formal rules. Third order governance refers to the normative principles and values that guide the behaviour within first and second order governance. This implies that third order governance is essentially about shaping the scope of first and second order governance through informal rules. Hence, the concept of third order governance has some similarities to the set of 'good governance' principles of UNDP, which are legitimacy, direction, performance, accountability and fairness[3]. In short, first order governance concentrates on problem solving and opportunity creation, second order governance is about the creation of formal institutions, and third order governance refers principles or informal rules that guide governance. The interactive governance approach assumes that the interaction between the three orders is essential for effective and legitimate governance. They assist in understanding the variety of interactions that take place within governance (Kooiman, 1999:78; Bavinck *et al.,* 2005:33; Graham *et al.,* 2003; UNDP, 1997)

[2] For a detailed explanation of interactive governance, consult Kooiman, 2003.
[3] We will use 'acceptance of authority' as a definition of legitimacy, as explained by Lipset, 1981.

These three categories of governance can be subdivided in other elements. The first order of governance – problem solving and opportunity creation – consists of an interrelated set of images, instruments and actions. The concept of images refers to the collection of ideas, goals, solutions, intentions and purposes, and knowledge. They relate not only to the specific problems or opportunities, but also to fundamental assumptions such as the interaction between human beings and the environment. Through the discussion on images in governance processes, it is possible to make the different viewpoints that participants have explicit. Instruments can be 'soft' or 'hard'. Soft instruments can be pressure with information, or taxes or fines. Hard instruments are related to the use of physical force. As a consequence, instruments can be used for a wide range of different goals that need to be achieved. The context in which a goal needs to be achieved can change, therefore, a certain flexibility might be maintained in the choosing the proper instrument. Lastly, there is the concept of actions. This refers to the manner in which the instruments created are implemented. For example, a policy can be created as an instrument; next it has to be implemented as a form of concrete action (Kooiman, 1999:76; Bavinck *et al.,* 2005:34-35).

The second order of governance – the creation of formal institutions – can also be divided into three elements, which are vision, rules and frameworks. In other words, visions result in concrete frameworks through the creation of rules. An essential aspect of second order governance is to create, implement, maintain and change the formal rules within governing institutions, in order to provide frameworks that assist in the first order governance of problem solving and opportunity creation (Bavinck *et al.,* 2005:37).

The third order of governance – guiding with principles – is also divided into three elements, which are values, principles and criteria. The combination of the three can be seen as a way to evaluate the interactive governance process, to suggest new directions, and to critically analyse existing goals and when necessary, adapt them or introduce new ones. By looking at values, principles and criteria, the governance process can be made more transparent, which might improve the legitimacy of the process (Bavinck *et al.,* 2005:39).

In this section we have introduced many characteristics of interactive governance, which might confuse the reader somewhat. Therefore, an overview of these characteristics is given in table 3.1 below.

Table 3.1: Characteristics of interactive governance (source: Kooiman, 1999:78; Bavinck et al., 2005:33)

Category	Explanation	Purpose	Elements
First order governance	Problem solving and opportunity creation	Achieving goals	- Images - Instruments - Actions
Second order governance	Creation of formal institutions	Shaping formal scope for achieving goals	- Vision - Rules - Frameworks
Third order governance	Guiding with principles	Shaping informal scope for achieving goals	- Value / ethics - Principles - Criteria

Types of interactive governance

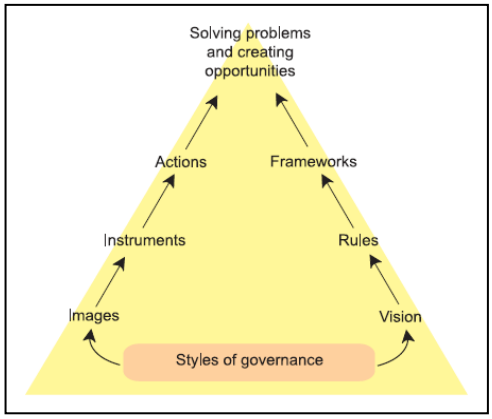
Apart from the category of characteristics of interactive governance – divided into the three interrelated elements of first, second and third order governance – Kooiman's theory includes a second category that concentrates on the types of interactive governance. He refers to types of governance as 'modes of governance', or 'styles of governance' as Bavinck *et al.*

call this category (Kooiman, 1999:83; Bavinck *et al.,* 2005:41). In this section we will refer to this category as 'types' of interactive governance. In essence, this category focuses on how the interaction is structured and organised between and within the governing organisations. These structures can be horizontal, vertical and any combination between the two. Interactive governance can be split up in three types: self-governance, hierarchical governance and co-governance.

Self-governance is applicable to almost all interacting organisations. It relates to a rather informal manner of interaction, which is embedded in the societal scope of societal interferences, where groups, organisations, or sectors govern themselves. Therefore, the key characteristic of self-governance is 'interaction through interference'. Self-governance is a capacity that evolves through learning processes and experience; it is not enforced from outside (Kooiman, 1999:84; Bavinck *et al.,* 2005:42).

The vertical type is called hierarchical governance. This refers to the 'steering of boats' as has been mentioned in the beginning of this section. It is a formal and top-down type of intervention, in which coordination, planning and control are the key characteristics. Often, hierarchical governance becomes visible through instruments such as laws and policies that guide and sometimes constrain human behaviour and interaction. Thus, the key characteristic of hierarchical governance is 'interaction through intervention' (Bavinck *et al.,* 2005:43).

Lastly, there is co-governance, which is characterised by horizontal and semi-formalised interaction. This means that co-governance concerns the use of organised forms of interaction, in order to achieve goals. An important implication of co-governance is that a single participant in the governance process cannot reach goals on its own; therefore, the participants recognise the need for horizontal oriented cooperation through interaction. Thus, the key characteristic of co-governance is 'interaction through interplay' (Bavinck *et al.,* 2005:43).



Governance in practice can also be a hybrid between these three types. A crucial challenge in governance seems to be to find the right mix between self-governance, hierarchical governance, and co-governance. For example, co-governance can be more horizontally oriented, implying that there is no leading organisation. But co-governance can also be vertically oriented, for example when there is one organisation that coordinates the interaction.

Figure 3.1: A visualisation of the interactive governance approach. First order governance is represented on the left side of the pyramid; second order governance is represented on the right side of the pyramid. Third order governance can be regarded as the scope around the pyramid (source: Bavinck et al., 2005:41).

Interactive governance and economic growth

Interactive governance concerns the intentional interaction between organisations and institutions. For the economical welfare in a country, highly important aspects of interactive governance are the creation and implementation of policies that directly and indirectly influence economic growth, as a result of the interactive governance process. In this section, we are further exploring how interactive governance and economic growth relate to each other.

The insight that governance can have a positive effect on economic growth was already explained in 1755 by Adam Smith, pointing at the aggregate value of "peace, easy taxes and tolerable administration of justice". In those countries where one or more of these three factors are not met, economic growth lacks behind in comparison to other countries. For example, the slow African growth has been directly linked with a failure of governance (Collier and Gunning, 1999 in Ndulu & O'Connell, 1999:53). Lipumba described the challenge in Africa considering the relation between governance and economic growth as follows:

> "Can African governments establish 'developmental states' that respect their budget constraints, allocate resources, pursue policies that develop human resources, and encourage private-sector saving and investment to generate productive employment and promote growth?" (Lipumba, 1994:88 in Ndulu & O'Connell, 1999:52).

However, from the perspective of interactive governance, both the statement of Adam Smith and Lipumba's description of the relation between governance and economic growth seem to reason from a rather classical approach that only includes a public perspective. As a consequence, these approaches assume that there is only little interaction between the public and private domain. To stress the interactive characteristic seems once again important. North for example, states that in essence, economic activities are shaped by the interaction between organisations and institutions (North, 1990:5). This implies that economic activities might be strongly influenced by interactive governance processes. Below, we will elaborate this in more detail.

If we focus with more depth on the subject of governance and economic growth, we can distinguish two broad theoretical approaches; market-enhancing governance and growth-enhancing governance[4].

Market-enhancing governance theories relate to the self-governance perspective which was mentioned before. Essentially, the market-enhancing theory suggests that there should be little interaction between the public and private sectors, in order to achieve economic growth. Thus, the relation between interactive governance and economic growth is approached from a perspective that the private sector should 'govern itself' as the most suitable way to create opportunities for achieving economic growth. At the same time, there should be less hierarchical interference of the public sector, because is likely to distort the functioning of the market.

Opposing these market-enhancing theories, are the growth-enhancing governance theories that relate more to co-governance perspectives and different types of interactive governance. Within these views, it is claimed that markets in developing countries do not function properly in the first place. In short, it is claimed that 'young and undeveloped' markets are likely to be rather inefficient, internationally uncompetitive, and not profitable. To assist the private sector in becoming more efficient, competitive and profitable, the public sector should be involved in the process of economic development. Through this form of interactive governance, opportunities for economic growth can be created.

If one analyses these two approaches, it becomes clear that they represent a traditional division in the field of social science; market-enhancing governance theories can be associated with positivism in general, and neoliberal or monetarist theories in specific. On the other hand, growth-enhancing theories can be associated with post-modernism in general, and structuralist or developmentalist theories in specific[5].

In the process of economic development in a country throughout the time, it might be possible that market-enhancing self-governance and growth-enhancing co-governance are both applicable. It seems assumable that a hybrid form between the two can exist,

[4] The analysis of these two approaches is a combination of Khan, 2006 and Kooiman, 1999.
[5] For further reading on positivism and post-modernism, consult for example Bernard, 2000.

depending on the phase of economic development. In the early phase, when markets in developing countries can be inefficient, uncompetitive and not profitable, it might be useful that private and public parties interact in order to achieve economic growth. This is in line with the growth-enhancing co-governance approach only. When the private sector becomes more efficient, competitive and profitable, the former form of interaction in the governance process might have to change. In other words, the roles of private and public parties in the interactive governance process might have to be adapted to the new circumstances. It might be the case that, as the market-enhancing self-governance theory argues partly, the role of the public parties can become somewhat distorting in the new situation that evolved. This would imply that the roles of public and private parties shift; those of the public sector might have to 'step back' in the interaction process, while those of the private sector might 'step forward' in the process. Thus, in the long-term process of economic growth, the roles of public and private parties might depend on the phase of the development process; this implies that these roles of public and private parties should not be static, but need to be dynamic in order to adapt to new circumstances or new stages of economic development.

This type of assumptions is in line with Kooiman's theory on interactive governance. He argues that different forms of co-governance have arisen around the world simultaneously. This implies that in governance processes, governments might be involved as an important cooperating partner, for example through public-private partnerships. In this respect, Kooiman notes that it might be more suitable to regard the roles of government in interactive governance as shifting, rather than shrinking. This might imply that the roles of non-governmental participants in interactive governance shift too (Kooiman, 1999:84).

Review of the section

In this section we have explored the concept of interactive governance, by making clear what the concept means, what the characteristics are, what types of interactive governance can be distinguished, and how interactive governance relates to economic growth.

We have made clear that one of the many ways to look at the concept of governance is the interactive governance approach. Interactive governance can be viewed as the intentional interaction between and within groups of individuals that structurally cooperate to achieve one or more common goals. At the same time, the scope in which these goals can be achieved is shaped by formal and informal rules.

Interactive governance can be split up into an interrelating set of categories, consisting of first, second and third order governance. First order governance deals with solving problems and creating opportunities, second order focuses on the creation of formal institutions to facilitate first order governance. Third order governance is about guiding governance with principles, and applies to both first as second order governance.

Three types of interactive governance can be distinguished; self-governance, hierarchical governance, and co-governance. Self-governance is characterised by interaction through interference, hierarchical governance is about interaction through intervention, and co-governance deals with interaction through interplay. Of course, mixed types of governance can be possible too.

The relation between interactive governance and economic growth can be approached from two perspectives, market-enhanced governance and growth-enhanced governance. The first perspective states that there should be little interaction between the public and private sector, because the public sector is likely to distort the free market in which the private market operates. The second perspective argues that economic growth can be achieved through interaction between the public and private sector. Through this interaction, the public sector can assist the private sector in becoming more efficient, competitive and profitable. The roles of the public and private sector in the interactive governance process might change, depending on the different phases of long-term economic development.

The interactive governance approach is rather new in the governance discussion. It seems that there is a need for a new approach of governance. The 'old-fashioned' idea of turning to government for solving problems, and to the private sector and the market for the creation of opportunities, seems to be somewhat disconnected from reality in modern societies. Instead, societal problem solving and opportunity creation are public as well as private concerns. It just depends on the context if public or private actors take the lead in the interaction process (Bavinck *et al.,* 2005:34). Thus, it seems that present and future problems in a globalising world are increasingly more complex; this challenges the interaction between organisations and institutions, and calls for new insights in this interaction.

The strength and weakness of interactive governance theory is that it does not explicitly focus on organisations and institutions. Therefore, we will continue this chapter by specifically looking at 'organisations' and 'institutions'. The latter concept will specifically concentrate on the 'formal rules' of property rights.

3.3 Participation in development – organisations

Organisations or institutions?
Institutions are a popular concept used by social scientists, politicians, managers and many others. The concept is sometimes used as a synonym for 'organisations', or it is used intertwined with 'institutes'. In the section on interactive governance, we already had a short look at organisations and institutions. In this section, we will explain the difference between the two more precisely.

We will start with repeating the definition of both concepts. An organisation can be defined as:

> Structural cooperation between a group of individuals to achieve one or more common goals (derived from Princeton University, 2006).

Considering the concept of institutions, the following definition will be used, which is derived from North (1990:3):

> Institutions are formal and informal rules that shape human interaction.

These two definitions make clear that an organisation always exists of institutions, but that institutions do not always exist of organisations. But what is the crucial difference between the two? Again, North helps us by explaining this. He states that if institutions are the rules of the game, organisations are the players of the game (North, 1994:361). Institutions are formal and informal rules that constrain human interaction. Organisations are those who solve problems and create opportunities through cooperation, within the framework of institutions. This is in line with the section on interactive governance, and confirms once again that there is a continuous interaction between organisations and institutions. The type of organisations that come into existence and how they evolve, are fundamentally influenced by institutions; at the same time, organisations influence how institutions evolve (North, 1990:5).

As mentioned above, organisations and institutions are often used intertwined. However, as North makes clear with his comparison of a game, they are essentially concerned with two separate subjects. In the existing literature, organisation and institutions are not always clearly distinguished. As a consequent, some articles can become very fuzzy.

If we want to understand a development process – for example the development of the salmon sector in Chile – we have to understand who participates in the process and why. But we also have to look at formal and informal rules the frame the scope in which the participants operate. This section deals with the actions and interactions of organisations in development processes. The next section focuses on the rules in development processes, and more specifically property rights.

Characteristics of organisations

First of all, we have to ask ourselves why organisations exist. The definition above helps us finding this reason. Goals can be achieved in different manners; individually and in a group. However, if a goal becomes too complex to be achieved individually, or when more goals have to be achieved that go beyond the possibilities of an individual, then individuals have to cooperate. Moreover, cooperation between individuals can result in a higher material or immaterial profit than the combination of the separate individual efforts. This is nothing new to human beings; thousands of years ago individuals already cooperated in order to hunt. To catch a deer for an individual can be a tricky task; however, when a number of individuals work together, the chances for catching the animal increase significantly. Thus, organisations are essentially about creating possibilities through the cooperation between individuals.

Now we can make the step towards identifying the crucial characteristics of organisations. As mentioned above, organisations essentially exist to achieve goals. According to Etzioni (1964), an organisational goal is the desired state of affairs, which the organisation attempts to realise. In other words, goals are about certain future states, toward which a majority of the organisation's means and the major organisational commitments of the participants are directed. According to Barnard, when abstracting at a maximum level, an organisation has to meet two characteristics in order to come into existence and then survive: it must be *effective* and it must be *efficient*. An organisation can be considered *effective* if it achieves the desired goals. An organisation is *efficient* if it has 'the capacity to maintain itself by the individual satisfactions it affords' (Barnard, 1968 in Jarillo, 1988:36).

The management of an organisation creates policy through decision-making in order to make clear which goals are to be achieved and how. The other participants of an organisation carry out the policy of the management. Often this is done through departments in order to provide the organisation with a certain structure, so that the cooperation between the participants can take place in a more efficient manner. The structure of an organisation can vary between the opposite ends of vertical control and horizontal freedom. Vertical control implies hierarchy and a top-down structure in which the participants of the organisation are coordinated and directed by their superiors. In this form of organisations, the participants are told which goals to achieve, and how to achieve them. A horizontal form of organisation implies less coordination and therefore more freedom for the participants. It involves a bottom-up approach, in which the participants know what the goals are that have to be achieved, but they have more freedom in deciding how to achieve these goals. Hence, in practice organisations are a hybrid between hierarchical control and horizontal freedom.

Another characteristic of organisations is that the participants are unconsciously or consciously in a learning process. Through their work they are constantly expanding their experience in relation to specific topics; this experience again internally reshapes the organisation. Learning processes improve efficiency of working methods of the participants and therefore they contribute to the evolution of the organisation. In somewhat broad terms, North also mentions that the most fundamental long-run source of change is learning by individuals of organisations[6] (North, 1994:361).

Organisations can be formal and informal. A formal organisation is registered at a notary and has legally approved statutes; because of this characteristic, a formal organisation also has the possibility to act in juridical manner. Informal organisations are not registered at a notary, do not have statutes with a legal status, and therefore they cannot act in a juridical manner. Some authors claim that organisations are formal per se; this is problematic however, because it automatically excludes certain organisations, such as terrorist organisations.

Organisations operate on different levels; from local, regional and national to international ones. On the local level, we can think of an organisation set up by local fishermen, for example to prevent a further expansion of the salmon sector. On the regional

[6] For more information on learning organisations, see for example Senge, 1990

level, we can think of a producers association that represents the interests of the salmon sector. On the national level, there are public organisations such as the Sub-secretariat of Fishery, with the goal of creating and implementing regulations on aquaculture. On international level, we can think of organisations such as the Food and Agriculture Organisation (FAO) of the United Nations, with the goal of defeating hunger in the world. Because these organisations operate on different levels, they have different goals. Some goals can be achieved on a short-term, other goals can only be achieved on a long-term. The nature of the goal also implies that organisations can be of a temporal or of a permanent character.

Types of organisations

There many different manners of dividing organisations into categories. North for example, distinguishes between four different types of organisations. Firstly, there are political organisations such as city councils, regulatory agencies, political parties, and tribal councils. Secondly, there are economic organisations, such as firms, trade unions, family farms, cooperatives and banks. Thirdly, there are educational organisations, such as schools, universities, and training centres. Lastly, he recognises social organisations, such as churches, clubs, and civic associations (North, 1990:110). The problem is however, that there are organisations that fit in two of these categories at the same time. For example, Fundación Chile is an institute that is funded both publicly and privately, with both political and economical goals.

Therefore, we will use a different way of categorising organisations. We are separating them into three groups: public, public-private and private organisations. Public organisations for instance exist of national governments, ministries, and sub-secretaries. Public-private organisations can for instance exist of universities that are funded both by public organisations as by private organisations, or they can exist out of research institutes, such as Fundación Chile. The group of private organisations is the most comprehensive one, existing for example out of NGOs and companies.

Organisations and economic growth

North argues, that the interaction between institutions and organisations shape economic activities. He also claims that the type of organisations that come into existence and how they evolve, are fundamentally influenced by institutions; at the same time, organisations influence how institutions evolve (North, 1990:5).

Most of the literature focuses foremost on institutions and economic growth, and less on organisations and economic growth. This implies that we have an abundance of information about the rules that influence development, but less information on the participants in development. Moreover, considering our focus on organisations, it is also relevant to mention that we do not want to zoom in at the cooperation of individuals *within* a single organisation; we want to zoom out and look at the combined efforts and cooperation *between* organisations. Indeed, it is not a single organisation that contributes to economic growth in a significant manner; it is the aggregate of cooperating public, public-private and private organisations that contribute to economic growth.

In the remaining part of this section on organisations, we are focussing on strategic interorganisational cooperation. For this analysis, we will assume that long term cooperation between organisations can – in certain circumstances – structurally contribute to economic growth. To understand this, we have to concentrate at the possible reasons for organisations to cooperate with each other.

Barringer and Harrison (2000) have analysed existing theories on strategic interorganisational cooperation[7]. They found out that six theoretical approaches are often used in the scientific literature. These are the transaction costs economics, resource dependence, strategic choice, stakeholder theory, learning theory, and institutional theory. Below, we will shortly discuss the characteristics of each of these approaches. We will also discuss in how far these approaches might be useful for us in order to analyse the involved organisations throughout the development of the salmon sector in Chile.

Transaction costs economics concentrates on the manner in which organisations should extend their activities beyond their scope through cooperation in relation to the minimisation of transaction costs and the highest achievable profits. The theory logically assumes that profit organisations maintain distinct methods and techniques towards their way of production. These differences might exist of several reasons such as the scale in which production takes place, the varying levels of experience, and geographical advantages (Child & Faulkner, 1998; Kogut, 1988).

Because of these differences in production methods and techniques, profit organisations also have different transaction costs. Therefore, the theory assumes that profit organisations will start to cooperate when there are possibilities to reduce transaction costs in order to make production cheaper and profits higher.

However, there is a crucial problem of the transaction costs economics approach in relation to explaining strategic interorganisational cooperation. It assumes that profit organisations will always act rationally and that they are continuously focused on reducing transaction costs. It is very likely that this assumption reduces reality too much. For example, the theory cannot explain why an organisation would maintain contacts with other organisations that do not directly reduce transaction costs. Indeed, not all interorganisational cooperation exists because of reducing transaction costs. The theory is not much of use to explain why organisations would cooperate in order to build up a new sector, such as the salmon sector in Chile thirty years ago. At that time, a number of public, public-private and private organisations cooperated in order to execute experiments with production methods. Not a single organisation was making a profit because production did not even start; therefore there were no transaction costs to be reduced at all. But yet these organisations were intensively cooperating. Moreover, not all involved organisations were organisations that had a primary goal of profit making. As a consequence, the transaction cost economics approach cannot explain why such organisations would cooperate with other organisations.

The resource dependency approach is based on the idea that strategic interorganisational cooperation exists because organisations need to obtain resources (Scott, 1987). Therefore, the theory states that because of this necessity to find resources, and of the possibility that an organisation might not be able to acquire a resource on itself, organisations might be dependent on one another. The core of the theory focuses on how these dependencies can be managed in a proper manner. The management of interorganisational dependencies can be done in two ways. First, organisations need to take control over the most important resources, so that they are less dependent on other organisations for acquiring these resources. At the same time, being the second requirement, organisations must take control over the most important resources of other organisations, so that these organisations become more dependent on them (Thorelli, 1986; Pfeffer & Salancik, 1978).

In the perspective of resource dependency, organisations are part of an ‘arena of power plays’, in which they strategically cooperate to compete. The producers association of SalmonChile, created in 1986, is an example of this. The main goal of this new private organisation was to cooperate between producers in relation to improve marketing strategies and to create a quality certification system. Salmon producers realised that they needed to cooperate on a national level, in order to be able to compete on a national level.

[7] The six approaches in this section are all based on Barringer and Harrison, 2000.

The resource dependency theory seems to be useful in the example of SalmonChile, at a phase where the development of this sector was well under way, and focusing on the interaction between the national and international level. However, the theory is problematic if we are analysing earlier stages of the development of the sector at a national or regional level. At this time, resources such as information, know-how and experience were scarce, but all organisations had this problem and therefore there was no competition between the organisations. Since the theory assumes the arise of cooperation because of competition on acquiring resources by organisations, the consequence is that the theory cannot help explaining why there was strategic interorganisational cooperation in order to build up a new sector in the early phase of development.

The approach reasons from the perspective of scarce resources through which organisations need to cooperate. As a consequence, the approach does not take into account the resources that are less scarce. But because of less or non-scarce resources, organisations can still decide to cooperate; in fact, an abundance of resources can be an important reason for cooperation. This mainly depends on the nature and characteristics of the resource. For example, public, public-private and private organisations of the salmon sector in Chile have been cooperating in relation to the demand and supply of concessions, even when there were plenty concessions, and plenty of approved locations for cultivation. Thus, the resource dependency approach does not help us in explaining this cooperation.

The strategic choice approach explains strategic interorganisational cooperation through the assumption that organisations are always interested in expanding their influence on markets (Jarillo, 1989; Kogut, 1988; Shan, 1990). This is a very broad approach, while organisations can apply many different cooperating strategies. As mentioned above, profit organisations form alliances to increase their profits by exploring new markets. More concretely, this can take place through the joint creation of new goods or services, to improve efficiency, to reduce production costs, or to access new technologies. Moreover, profit organisations often cooperate in order to reach economies of scale, such as clusters. This cooperation improves their know-how about production methods and it spreads risks among a number of organisations instead of a single organisation (Harrigan, 1988; Koh & Venkatraman, 1991; Powell, 1990; Rockwood, 1983). Note that profit organisations can establish strategic alliances because of reasons that are explained by the transaction costs economics approach and the resource dependency approach (see above).

Barringer & Harrison (2000:375) – upon which this section is based – state that strategic choices of organisations in order to create strategic interorganisational cooperation, can be split up into four groups. The first group is cooperation that improves the influence of organisations on the markets. They do this through a form of protection, for instance through the establishment of an oligopoly. Take-overs in the Chilean salmon sector are a good illustration of the expanding of power of profit organisations on foreign markets. The second group is cooperation between organisations in order to get more political power. For instance, through more political power, these organisations can improve their lobby activities at public organisations in order to influence policy making processes. This influence often takes place through producers associations such as SalmonChile, with the intention of being able to speak with one strong voice. The third group exists of cooperation that improves efficiency in research and development and the marketing of products. This form of cooperation is closely related to the resource dependency approach. In the Chilean case, the early phases of the development of the salmon sector were influenced by ProChile that opened up new offices in new export countries for Chilean salmon. These marketing strategies significantly contributed to the expansion of exports. The last reason for strategic cooperation is the possibility to diversify in the production of goods or services. For example, when Chilean salmon companies would only offer canned salmon, their export possibilities would be very limited. Diversifying in production is thus highly important for export growth; however, individual profit organisations might be limited to develop new products on its own. In such a case, organisations are likely to form strategic alliances.

Although the strategic choice approach is very broad and overlaps with other approaches, it provides us useful insights in understanding the reasons for interorganisational cooperation. Nevertheless, as is the case with the transaction costs economics approach, the strategic choice approach is only applicable to profit organisations or in other words firms. This comes forth out of the assumption that organisations want to expand their influence on markets; in short, public and public-private organisations that do not have profit making as their primary goal, are not taken into account. Indeed, firms are central to this approach, which implies difficulties to explain early stages of the development of the salmon sector, when there were more public and public-private organisations involved, and almost no private organisations or firms.

The stakeholder approach sees organisations as being at the core of a network of stakeholders. These stakeholders can be both individuals as organisations, such as providers of fishmeal and oil for fish feeding, transport services, cooling services, processing services, and producers of materials for pisciculture and mariculture, providing net pins, cages and hatchery materials. The network of an organisation is seen as a complex set of formal and informal contracts between the organisation and its stakeholders (Jones, 1995). Note that the stakeholder approach is strongly connected with the network approach. Moreover, because of the focus on formal and informal contracts, this approach forces us to focus very much on institutions. As we mentioned above, the risk of such an approach is to concentrate too much on the rules and too less on the participants in development processes. Thus, if one wants to understand the relationships between organisations, formed and constrained by formal and informal rules, this approach might prove useful. Nevertheless, if we want to look at how the cooperation between organisations results in a concrete contribution to the development of a sector, the stakeholder approach might prove less useful. Moreover, the stakeholder approach does not specify how to analyse the formal and informal contracts between the core organisation and its stakeholders. For example, the approach does not provide us with tools to rank the importance of contracts, or to distinct relevant formal and informal contracts from irrelevant contracts. Therefore, we run the risk of spending too much time on analysing, through which the possibility of drawing meaningful conclusions is reduced.

The organisational learning approach explains strategic interorganisational cooperation as being the result of the strategic utilisation of opportunities by organisations to learn. The main reasons for cooperation with the aim of learning can be to jointly gain and share specific technological skills or knowledge (Hamel, 1991; Mody, 1993; Shan, 1990).

Organisational learning can be split up into exploration and exploitation activities. Organisational learning through exploration takes place with the aim of finding out about new chances for economic growth, which can involve research and development, innovation, invention, capacity building, and the creation of new goods and services (Cohen & Levinthal, 1990; Lane & Lubatkin, 1998). For our research, exploration through organisational learning as a result of strategic interorganisational cooperation is highly important. This concept helps us were other approaches do not: it offers the possibility to analyse and understand the early phases of the development of the salmon sector in Chile, considering the involved organisations. Moreover, it also provides a solution to the problem that the other approaches are almost without exception focusing on firms, while other non-firms organisations are also highly relevant for our analysis.

Organisational learning can also take place through exploitation. The latter relates to the expansion of the productivity of capital and organisation assets, by developing existing capabilities and reducing costs. In this case, organisations cooperate to create economies of scale such as clusters (Levinthal & March, 1993). Clearly, organisational learning through exploitation focuses on profit organisations or firms. Still, this is a useful concept for our analysis, because it can assist in understanding why profit organisations cooperate in a defined geographical area, when their business has already developed into a competitive and ‘grown-up’ sector.

In broad terms the organisational learning approach is useful because it enables us to look at the salmon sector in relation to interorganisational cooperation in the different phases of its development. The possibilities of the applicability of this approach are also limited, because learning processes are hard to analyse; all organisations are to a certain extend involved in learning processes, but these processes result in knowledge and skills, and therefore learning processes take place in an almost invisible manner. As a result, it is hard for researchers to 'measure' and 'analyse' concrete learning processes of organisations.

The last and sixth approach analysed by Barringer & Harrison is the institutional approach. The approach states that organisations are under a certain pressure due to the internal and external institutional environment[8]. An organisation perceives this pressure because it needs a certain amount of legitimacy from other organisations that expect this organisation to act and behave according to formal and informal rules[9]. According to the institutional approach, strategic interorganisational cooperation is the result of perceived pressures of organisations to conform to formal and informal rules. Interorganisational cooperation will increase the legitimacy of the involved organisations, because they act and behave in line with the commonly accepted formal and informal rules in their environment (Oliver, 1990; Scott & Meyer, 1983; Zucker, 1977).

As Barringer & Harrison (2000:380) explain, especially small organisations can benefit from strategic interorganisational cooperation, in the perspective of the institutional approach. A small firm can increase its visibility, reputation, image and prestige – being part of the firm's legitimacy – through the cooperation with bigger firms that are already well-known. Indeed, this increased legitimacy through strategic interorganisational cooperation can open up new doors for these small firms.

By now it is clear that the institutional approach focuses foremost on explaining the utilisation of opportunities to increase legitimacy as a result of the cooperation between organisations that is restricted by the constraints of the framework of formal and informal rules.

The problem of the institutional approach however, is that it focuses very much on the formal and informal rules in combination with 'acceptance of their activities' (legitimacy) as an explanation for strategic interorganisational cooperation. Thus, the approach cannot help us to explain how sectors can develop in the early stages, as a result from strategic cooperation between organisations. Because activities took place at a very small scale in the beginning, the 'acceptance of activities' was simply not an important issue at that time. Moreover, because this theory concentrates on smaller firms cooperating with bigger firms, it automatically assumes that these bigger firms do actually exist. Nevertheless, in the early stages there were no big firms at all; there were only a few small firms that experimented with cultivation methods. Again, the institutional approach is problematic to explain the early stages of development of the salmon sector.

Lastly, the institutional approach might be more applicable to developed countries and less applicable to developing countries. This is a consequence of the usage of the concept of legitimacy or the acceptance of activities. In the case of Chile for example, there is little criticism on the activities of the salmon sector, because it provides employment and economic growth. Another subject that receives little criticism is the possible impact of salmon cultivation on the environment. Thus, the activities of the salmon sector are accepted and supported in Chile, just as any other sector that significantly contributes to economic growth. This seriously undermines the assumption of the institutional approach, claiming that the main reason for strategic interorganisational cooperation is increasing the legitimacy of the involved organisations.

Now we have analysed these six approaches on strategic interorganisational cooperation, we can clearly distinct and understand the different reasons of why public, public-private and

[8] Consult the beginning of this section for an explanation of the concept of institutions.
[9] Legitimacy in this thesis is defined as 'acceptance', in this case of a firm's production activities.

private organisations would cooperate with each other. As mentioned above, we assume that long term successful strategic interorganisational cooperation can result in economic growth. We have seen that some approaches are more useful than other for our analysis of the Chilean salmon sector. Moreover, it has become clear that the approaches differ in the manner in which they are applicable to a specific stage of development of the sector. Importantly, a combination of several approaches might prove to be very effective in explaining how the cooperation between organisations contributed to the different stages of development of the sector.

In total, nine different reasons for strategic interorganisational cooperation can be distinguished with the help of the approaches described above. The first reason is creating possibilities for accessing resources, such as capital, skills, knowledge and technology. The second reason is the creation of economies of scale, offering possibilities to reduce production costs and jointly gain and share knowledge. The third reason for strategic interorganisational cooperation is sharing risks and costs, which might be too high for individual organisations. Fourth, there is the reason of creating possibilities for access to foreign markets, which might be hard and expensive for individual profit organisations. Fifth, organisations might cooperate in order to develop new products and services. Again, combining technology, skills and knowledge might result in joint discoveries for diversifying the production line or service. Sixth, cooperation can take place to learn collectively, for example in relation to product development. Seventh, organisations can work together to enter markets quicker. Eighth, interorganisational cooperation can take place in order to be able to collectively lobby, to influence policy-making processes of public organisations. The last and ninth reason is that cooperating organisations can build up their competitiveness, especially on an international level (Barringer & Harrison, 2000:385).

We have looked at reasons for cooperation between organisations, so now we can make the step to concentrate on forms of cooperation. Out of the list of Barringer & Harrison, two forms are relevant for our analysis; networks and alliances.

Networks can be any combination between public, public-private and private organisations. The combination of organisations is established to create new opportunities and achieve goals that are hard to achieve for an individual organisation. The possibilities of utilising new opportunities and achieving new goals take place within the framework of constraints of the network. These constraints exist foremost of informal rules and to a lesser extent of formal rules; thus the possibilities of a network are defined by its limits or institutions.

Networks often have a ‘hub’ organisation that organises the interdependencies between the participating organisations of the network (Dunning, 1988; Harrigan, 1986; Jarillo, 1988). Such a hub organisation can have both a coordinating as a facilitating function in a network. Moreover, hub organisations can have a catalyst function in relation to inspiring and stimulating participating organisations. As Barringer & Harrison (2000:388) mention, the result of a strong hub organisation in a network is a constellation of organisations that are inspired to focus on their distinctive competency in an integrated effort to produce a new product, a service, or a new technology. Moreover, Snow *et al*. (1992) state that the hub organisation typically relies on some type of core skill such as manufacturing, design, or assembly. Barringer & Harrison (2000:388) also claim that networks are likely to arise when complex tasks must be executed. This task complexity relates to the varying specialised inputs that are needed to execute the task. When tasks are highly complex and when they can only be achieved on a long term, but with the prospect of possibly high profits, networks are likely to be established.

The second relevant form of strategic interorganisational cooperation – according to Barringer & Harrison (2000:392) – is the alliance. The most common form of an alliance is the trade association. The reasons for establishing a trade association is to generate, gather and share trade information, to create market strategies, to provide legal, technical and strategic advice, organise seminars, trainings, expos, and to provide a platform for collective

lobbying in order to be able to speak with one strong voice (Gupta & Lad, 1983; Oliver, 1990).

Trade associations are important because the participants have the opportunity to improve their effectiveness and efficiency. In their production process and marketing strategies, they can reduce costs through the cooperation in an alliance (Bresser, 1988; Oliver, 1990). Furthermore, Gupta and Lad (1983) found out that trade associations can have a crucial pivotal role in creating and implementing industry standards. This assists a specific sector in their self-regulation, as an alternative to be regulated by public organisations.

Note that these two forms of strategic interorganisational cooperation – networks and alliances – are closely connected to each other. The similarity between the two is essentially that they both exist because of cooperating organisations, aiming at the achievement of common goals. The difference lies in the balance between formal and informal cooperation. Networks tend to be characterised foremost by informal cooperation and to a lesser extend by formal cooperation. Alliances are characterised foremost by formal cooperation and to a lesser extend by informal cooperation.

Review of the section

This section has made clear that an organisation is one of the most crucial manners in which human beings achieve common goals through the cooperation between individuals. Through the cooperation between individuals, more complex and long-term goals can be achieved. We have made clear that organisations essentially utilise opportunities of the aggregate efforts of individuals to achieve these common goals. At the same time, the possibilities to utilise opportunities for achieving goals is restricted by institutions or formal and informal rules. Through the analysis of strategic interorganisational cooperation, we have explained that the main reason for its existence is essentially the same as of a separate organisation. Indeed, strategic interorganisational cooperation exists in order to achieve complex and long-term goals through the interaction between these organisations. For a separate organisation, certain goals might be impossible to achieve individually; through strategic interorganisational cooperation new possibilities to utilise opportunities arise; yet again, these possibilities are constrained by formal and informal rules.

We also analysed in more detail why organisations cooperate, to specify the broader reason of achieving complex and long term goals. These reasons were derived from six approaches that try and explain the existence of strategic interorganisational cooperation. The most relevant reasons for cooperation between organisations in relation to this thesis are the following: accessing resources, creating economies of scale, sharing risks and costs, gaining access to foreign markets, developing new products and services, collective learning, collective lobbying and lastly neutralising competitors.

Lastly, we have looked at two relevant forms of strategic interorganisational cooperation – networks and alliances. A network is a broad concept, pointing at any combination of organisations that are working together to achieve one or more common goals. A network becomes highly important when it has a hub organisation that coordinates and facilitates the cooperation between the participating organisations. Such a hub organisation can have a catalyst function when stimulating and inspiring other organisations with new ideas. Alliances are a more formal form of cooperation than networks. A common form of alliance is the trade association, in which organisations participate to join forces in order to generate and share information, provide advice, to create and implement industry standards, and to collectively lobby by speaking with one strong voice.

3.4 Rules for development – property rights

What are property rights?
In this section we are focussing on property rights or institutions. Indeed, the two are synonymous. As we already explained in the section on organisations, institutions are formal and informal rules. This corresponds with the core of what property rights are. Therefore, we will choose the following definition of a property right:

> A set of rules that specify rights and obligations to possess, use or trade property (derived from Guerin, 2003:3).

Rules can be seen as the roots of property rights, providing a framework of 'possibilities' and 'constrains' for possessing, using or trading a resource. Thus, in the end the rules that shape property rights are ultimately decisive on how efficient or how strong or weak property rights are. One way to define rules is offered by E. Ostrom, stating that rules are 'generally agreed-upon and enforced prescriptions that require, forbid, or permit specific actions for more than a single individual'. In short, rules are prescriptions that create authorisations (E. Ostrom,1986 in Schlager & Ostrom, 1992:250).

It seems to be logical that property rights exist of rules, and that these rules are about rights; in this manner however, we run the risk of forgetting another important aspect of property rights, namely obligations. This is absolutely logical; if person A sells his land to person B, the right to own this land is transferred, which automatically involves certain obligations for both persons, such as the amount of money that person B has to pay to person A and that person A guarantees a certain quality and quantity of the land that he sells. This simple example makes two things clear. First, the example makes it assumable that property rights might play an important role in making economic activities more transparent and efficient; we will further explore this below in the part on property rights and economic growth. Second, the example illuminates that it is assumable that property rights consist not only out of rights, but also out of obligations. This is assumable too when we focus on the definition of institutions, stating that institutions are 'humanly devised constraints that shape human interaction' (North, 1990:3). Paradoxically, because of certain constraints, opportunities arise, or in other words, rights are possible through obligations. Indeed, without obligations, rights cannot exist. The argument that property rights exist of rules and that these rules exist out of rights and obligations can also be derived from the way in which E. Ostrom's approaches the definition of rules, mentioned in the foregoing paragraph. One possibility for describing what a 'right' is can be derived from V. Ostrom, who states that a right refers to a specific action that is authorised (V. Ostrom 1976 in Schlager & Ostrom, 1992:250). Consequently, we will define an obligation as the responsibility to carry out a specific action.

The last concept of the definition of property rights exists of property. This allows us too understand to *what* the property right is applicable. One way to approach the meaning of property is to divide the concept in two elements of assets; fixed assets, and movable assets. Fixed assets can be characterised by the fact that they cannot be moved and that they are relative to a certain geographical location. Fixed assets can be land, surfaces and depths of water such as lakes, rivers and oceans, roads, and buildings. Movable assets can be property that does not have a physical existence, such as knowledge, patents, inventions, copyrights and software. Furthermore, movable assets can be property with physical existence, such as for example salmon (CMU, 2002).

To cultivate salmon, producers are using a defined portion of water of the national commons, referring to the territorial waters such as the ocean. The national commons are the property of all citizens in a country, and therefore they are necessarily managed by a national government. Thus, the ocean is a natural resource that can be used – among others – for economic activities such as salmon cultivation.

Since property rights are a set of rules specifying rights and obligations of possessing, using and trading of property – in this case applicable to the national commons or the ocean – a property rights system might function as an instrument to coordinate and control economic activities that are directly related to the 'utilisation of property' or in this case the utilisation of natural resources. Thus, with property rights, it is possible to make clear who can use what, where, how and when. This again implies that a property rights system can also function as an instrument to coordinate and control the impact that this economic activity has on the natural resource that is being utilised. Out of this statement, we can derive that property rights are essentially instruments to create order and reduce uncertainty. As North claims: 'Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange' (North, 1991:97). As we will see below, property rights might be an important form of institution.

Characteristics of property rights

In this part of the chapter we are focussing on the rights and obligations that can be associated with property rights. Because the existing literature concentrates foremost on the characteristics of rights associated with property rights, there is an abundance of information available. Nevertheless, the same literature often forgets to look at the obligations that might be associated with property rights, causing a lack of information.

The characteristics of rights and obligations that the holder of a property right has, can be split up in four basic elements: security, transferability, duration and exclusivity of property rights. However, there is also literature that analyses these rights and obligations in more depth, adding two more elements, namely flexibility and divisibility of property rights. The combination of these six elements of rights and obligations give shape to property rights, and make it possible to analyse property rights, in order to look at the manner in which they function. We will deal with these seven elements below.

Security of a property right relates to the extent in which the rights of a property right are protected by the legal system of a country (Anderson, 2002:139). Protection is about rights but also about obligations; the holder has the right to be protected and to protect the property to a certain extent. This is also related to the obligations of public organisations in a country in order to assist in the protection of the property. Protection has also to do with the manner in which other individuals and groups in society challenge the rights that are part of the property right. Thus, security refers to the possibilities of the holder of a property right to resist these challenges and maintain the property right (Arnason, 2000:19). The 'challengers' of property rights can be very diverse. For example the way in which a salmon company has to fear that his property – the salmon – will be stolen by others. Or the likeliness that the government will suddenly change the regulations related to concessions (licences, or the right to use a natural resource). The manner in which the holder of a property right has to involve costs to protect and enforce the property right is also important (Scott, 2000a:6). If the costs for protection by the holder of the property right are very high, interested individuals or groups might have a reduced willingness to acquire the property, simply because their right of maintaining this property is not secure. If property rights are very secure because of a well functioning legal system, security can be categorised as strong; if property rights are very insecure due to a total lack of protection, security can be categorised as weak (Anderson, 2002:139).

Transferability of a property right refers to the manner in which it is possible for a property right holder to transfer it to another individual or group (Arnason, 2000:19). Sometimes, the holder has the obligation to transfer the property rights within a specific group. An example is Individual Transferable Quotas (ITQs) in fisheries, a form of property right that often obligates the holder that in case of transference, the quota can only be transferred to a fisherman such as the member of a fishery association. Property rights can be fully transferable or non-transferable or any possibility that lies in between these two (Anderson, 2002:137). The

manner in which organisations work internally and how they cooperate in order to formally process the transference of a property right is of crucial importance for the efficiency during the transference period. These organisations can exist out of one or more public organisations that are responsible for the paper work to arrange the transference of the property right. It is also possible that the public-private or private organisations are involved in the transference. If transference is relatively easy for the holder and does not take an excessive amount of time, we can categorise the transferability as strong; if transference is hard or impossible and takes an excessive amount of time, transferability is categorised as weak (Anderson, 2002:137). Transferability of a property right is believed to be crucial for the efficient use of resources. Strong transferability gives incentives to the holder to undertake long-term investments in a resource. Selling or leasing (a part of) the property right, gives the holder the opportunity to benefit from these long-term investments. Lastly, strong transferability can stimulate the holder to shift from a less productive to a more productive utilisation of the resource (Posner 1975 in Schlager & Ostrom, 1992:256).

Duration of the property right refers to the amount of time that the property right is valid (Arnason, 2000:19). Duration can vary from short, such as a couple of days, to very long, implying perpetuity. The latter refers to a strong duration of property rights; the first refers to a weak duration of property rights (Anderson, 2002:139). With a strong duration of property rights, the holder has more rights and fewer obligations. With a weak duration, the holder has more obligations and fewer rights. For example, the crab fishery in Alaska functions under a regime of permissions that allows the capturing of a specific specie of crab for a specified number of days per year, without imposing a quota. Ordinary fishing rights in capture fisheries frequently have a duration of a year, but they are often renewable (Scott, 2000b:110). Property rights that exist in relation to the ownership of land, commonly have a duration of an unlimited time span. As Scott mentions, if a property right's duration is short and not renewable, it is not likely that the holder will do any long-run improvements or investments. In the fishery industry, a relative long duration of a property right encourages the holder to make costly changes in the size and age structure of the fish stock. This might result in larger and more profitable catches (Scott, 2000a:6).

The exclusivity of a property right defines the possibilities for the holder to use and manage the property (Arnason, 2000:19). Utilisation and management of the property are strongly related to the manner in which the holder is in control with regard to decisions and access in relation to the property (Anderson, 2007:32). Thus, exclusivity focuses on the extent to which the holder can exclude others from the powers of ownership, and the utilisation and management of the property (Scott, 2000b:109). The ability to do this is influenced both by the rights and obligations of the holder on one hand, and on the other hand it is influenced by the rights and obligations of those who have influence from outside on the property right. Thus, the more interference from outside, the less exclusive is the property right (Scott, 2000a:5). Weak exclusivity exists for example when the holder of the property right has limited control over inputs, outputs and management. Lastly, there is a strong exclusivity when all decisions and access to the property are in full control by the holder (Anderson, 2002:139). In general it is believed that a strong exclusivity of a property right contributes to more incentives for the holder to undertake long-term investments during the utilisation and management of a resource (Schlager & Ostrom, 1992:256).

The flexibility of a property right is described by Scott (2000b:110). Flexibility relates to the manner in which it is possible for the holder and granter to make exceptions in relation to the official conditions of the rights and obligations of a property right. According to Scott, a key characteristic of flexibility of property rights is the possibility of passing on risks of unexpected events from the holder of the right to the granter of the right (Scott, 2000b:110). For example, a public organisation that grants concessions to cultivate salmon can obligate the holder to start using this concession within two years. If the holder of the concession does not comply, this public organisation can be 'flexible' and temporarily accept the non-

legal situation. If the holder and granter can or do not make any exceptions to official conditions, the property right can be defined as having a low flexibility. If the holder and granter can easily make exceptions to official conditions of the rights and obligations of the property right, the flexibility is high.

The divisibility of a property right is the legal possibility for the holder to change the granted scale of the property that is used. This implies that the degree of divisibility decides in how far it is legally possible to change the size or quantity of the asset that the holder uses or owns (Scott, 2000b:110). This is the case for example, when a salmon company has the possibility to split up the concession and transfer the different parts to new holders. This example makes clear that divisibility strongly relates to transferability. As Arnason explains, divisibility is the ability to subdivide the property right into smaller parts for the purpose of transfer or lease (Arnason, 2000:19). If it is very easy for a holder to subdivide the property, the property right has a high divisibility; when is very hard for a holder to do this, the property right has a low divisibility.

Table 3.2: Specification of property rights (Source: Guerin, 2003:5 who based this table on Scott, 1988; Scott & Coustalin, 1995; Pennings et al., 1996)

Nature of the right	**Valuation criteria**	**Characteristics of rights**	**Long-term value is optimal when right is**
Use of property	Flexibility and divisibility	Geographical area of the right	Universal – all relevant resources privately owned & entitlements completely specified
Possession of property	Exclusivity	Whether granter can modify right without compensation	Exclusive – benefits and costs accrue only to holders
	Duration	Temporal or perpetual right	
	Security	Actions that the holder may take	Enforceable – secure against seizure or encroachment
Trade in property	Transferability	Which right can be transferred to whom and whether approval is required	Transferable – rights can be freely transferred

The combination of the elements of rights and obligations – security, transferability, duration, exclusivity, flexibility and divisibility – makes it possible to specifically look at how a property right functions in practice. An overview of these elements is given in table 3.2. After analysing the separate elements we can classify a property right, for example as strong or weak. Anderson claims that strong property rights are a necessary condition for intensive aquaculture; moreover, he even declares that intensive aquaculture is not possible under weak property rights. If strong property rights are created and strengthened for intensive aquaculture, the efforts of the holder will focus on reducing costs, increasing efficiency, and intensifying production; and for this a longer-term perspective of aquaculture will arise (Anderson, 2002:140).

Types of property rights

In this part of the chapter we are zooming in on the different types of property rights. To illustrate this clearly, we will project these types on fisheries – involving both aquaculture and capture fishery. It might seem that this division between aquaculture and capture fisheries is not too relevant; however, the difference is crucial. As Anderson points out, the core difference is the degree in which utilisation of the resource can be controlled by management. These differences in control refer for example to the impact on the environment, production such as growth rate and size of the fish, the location of the activity, control of predators, technology, and marketing systems. Furthermore, Anderson argues that the degree of control is closely related to the strength of property rights (Anderson, 2002:133).

The overall concept for most types of property rights in relation to the utilisation of natural resources such as fisheries is the 'user right'. Logically, a user right refers to the rights and obligations of the holder to use fishery resources (Charles, 2001:131). In relation to the utilisation of natural resources in fisheries we can divide user rights in two main categories. Firstly, there are user rights that are dealing with accessing a natural resource, such as access to a part of the ocean. In this perspective, we define access as the right to enter a defined physical property. Consequently, access rights authorise entry to the fishery activity or to a specific fishing ground. Secondly, there are user rights that are dealing with withdrawing a natural resource, such as the withdrawal of certain species of fish. We define withdrawal as the right to obtain the 'products' of a resource. Withdrawal rights are the rights to a specified amount of fishing effort in terms of time or gear, or the right to extract a specified amount of fish (Schlager & Ostrom, 1992:250; Charles, 2001:132). In short, access is about the entry to a location of the activity, and withdrawal is about time span, technique and extraction.

Charles has worked out the access and withdrawal types of user rights. He splits up access oriented user rights in 'territorial use rights' and 'limited entry rights'. Withdrawal oriented user rights are split up in 'quantitative input rights' and 'quantitative output rights' (Charles, 2001:137).

Territorial use rights relate to the surface, the bottom, or the entire water column of a specific area. Therefore, it is important that the boundaries of the granted part of the territory are clearly demarcated and identifiable (Christy, 1982). According to Charles, territorial use rights exist in two forms. The first form of territorial use rights is the 'closed area approach', under which specified parts of the territory are closed for all holders. At the same time, other parts of the territory are open for farming or extraction for all holders. The second form of territorial use rights consists of the customary marine tenure approach, under which rights and obligations are assigned to the holder, in order to cultivate or extract fish in certain specified locations (Charles, 2001:138). Note that both forms crucially depend on the zonification of a territory, which must be regarded as the operationalisation of territorial use rights. Zonification concerns the selection of certain parts of the commons for a specific use. In this sense, zoning also creates a certain form of scarcity of a resource. Zoning can serve as an important instrument for the government or granter of the territorial user right to make clear where aquaculture or capture fishery can take place.

The second type of access oriented use rights in aquaculture and capture fishery is the 'limited entry approach'. Under this regime, the granter or government grants a limited amount of licences for aquaculture or extraction. Hence, this type of user right gives the holder the right to participate in the activity. Thus, licences are an instrument to control the total amount of right holders, for example to limit the number of new fishing vessels, or to limit the number of new fish farms. Thus, in general terms, the limited entry approach offers the possibility to control the impact of fishery activities on natural resources. In addition, this approach tends to generate higher incomes for those who are holding licences (Charles, 2001:139). Practice illustrates that higher incomes for license holders specifically occur when cultivation or extraction of hydro biological species has the potential to generate high profits in a relative short period, in combination with a high demand and a limited supply of licenses.

Considering withdrawal oriented use rights, there is the 'quantitative input right'. This form of use right refers to the assignment to the holder of the amount of time that the activity can take place and the amount and type of gear that can be used, such as the size of a fish farm or the size of a vessel. The effectiveness of the effort right, a synonym that is often used for quantitative input rights, mainly depends on two factors. First, it depends on the manner in which the effort right concerns a combination of input rights. This is important because effort rights that only include one input factor, often causes the holder to manipulate. Therefore, a combination of input rights reduces the likeliness of manipulation. Second, the effectiveness of the effort right depends on the manner in which it is possible for the granter or government to adjust the right in relation to technological innovations that influence the input factors (Charles, 2000:2).

Lastly, Charles identifies the quantitative output right or harvest quota. Firstly, the total allowable catch is part of this category, on the condition that the total allowable catch is subdivided to separate sectors, individuals or groups, each having a certain share of the total catch. Hence, total allowable catch is applicable to extraction fishery, while we could call it 'total allowable cultivation' in case of aquaculture. In this case, we speak of sector, community or individual quotas. Sector quotas can be applicable to aquaculture, for example with a special allocation for 'small' or 'large' fish farmers. Sector quotas can also be applicable to extraction fishery, for example for those who own 'small' or 'large' vessels. Community quotas are often assigned to right holders so that the community can regulate itself. The advantage is that the structure of the use right can be adjusted to local circumstances, reflecting specific norms, values or objectives of the community. Individual quotas are logically assigned to persons.

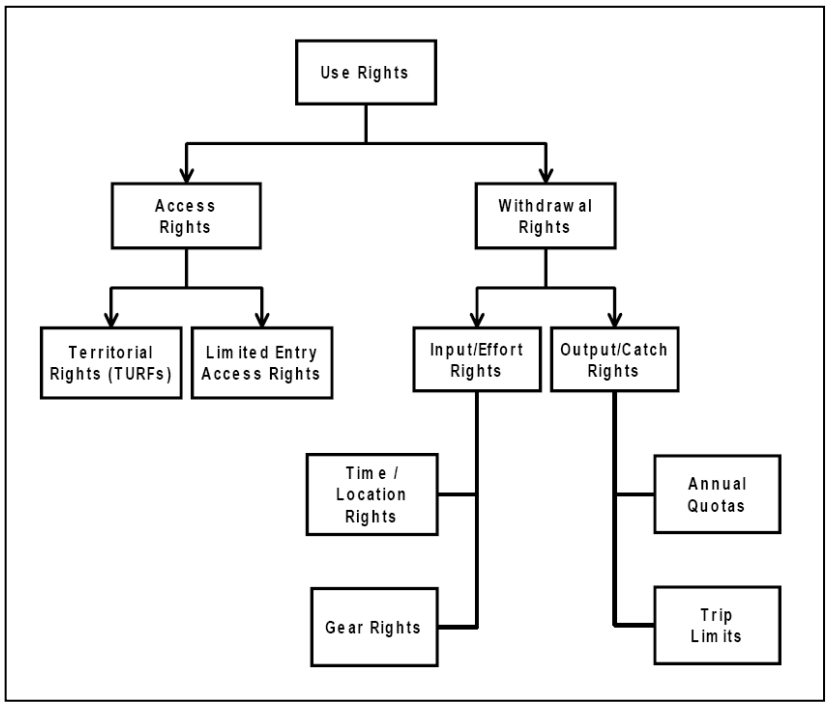


Figure 3.2: Division of use rights in relation to aquaculture and extraction fishery (source: Charles, 2000:2)

In case of extraction fishery, the holder can have the right to a certain amount of trips in combination with a certain allowable catch on each trip (Charles, 2000:3; Charles, 2001:141-142). In case of aquaculture, the holder can have the right to cultivate a certain amount of fish or shellfish relative to a defined amount of space.

In practice, this clear separation is unlikely to occur; in most cases use rights consist of hybrid combinations between these different forms. However, this strict division of use rights is useful for analysing and understanding the complex constructions of use rights in the real world.

Property rights and economic growth

In this part of the chapter, we will analyse how property rights can be related to economic growth. As we will explain below, property rights have the potential to be crucial for economic growth; without property rights, economic growth is very unlikely to occur. As Arnason writes, property rights are absolutely fundamental for productivity and production growth in economies and they are essential for almost everything that is usually regarded as economic progress. Property rights facilitate the existence of markets, but the opposite is not applicable; the existence of markets does not result in the establishment of property rights. Thus, the causal relationship is from property rights to markets and trade, not vice versa. This implies that the most important forces of economic coordination are property rights, not the market or market forces. As a consequence our economic system might be better referred to as the property rights system or the private property rights system, rather than the market system (Arnason, 2000:14-18). In the following part, we will focus in more depth on how property rights influence economic growth. We will split up the varying causal relationships in two categories. The first category exists of the influence of property rights on economic growth in general and broad terms, being applicable to all economic activities. The second category exists of more specified explanations of the influence of use rights – a form of property rights – on the management and utilisation of natural resources. Note that the arguments below reason only from a property rights perspective; thus, we reduce reality somewhat and neglect other important factors that influence economic growth.

In the first category, there are a number of causal relationships between property rights and economic growth. Strong property rights can give incentives to participants in economic activities, as an incentive to create and improve capital markets. The reason for this is that property rights make it possible for those who possess assets to turn them into capital. They give incentives for these participants to invest in physical or human capital and to adopt technology that is more efficient. Thus, strong property rights facilitate opportunities for individuals to benefit from production specialisation and therefore trading might arise easier. Well-defined and well-enforced property rights make it probable that firms are more motivated to gain control of production, with increased willingness to achieve high levels of production and productivity. This again might imply that firms will focus on achieving higher levels of efficiency in their manner of industrial organisation. Strong property rights have the potential to result in engagement of complex, long-term and multiple contract exchanges with enforcement. This means that property rights might accelerate and stimulate engagement in formal economic transactions. Thus, reliable property rights can serve as a way to lower transaction costs and reduce negative externalities, and this again might give incentives to firms to operate on larger scales and have long-term horizons (North, 1991:101; Van den Bergh, 2003:263; Acemoglu *et al.,* 2004:2-13; Neill, 2003:12; Neill, 2007:1; Aron, 2000:103-123; Anderson, 2002:149; Arnason, 2000:14-18). To summarise, a strong property rights system has the potential to increase order, stability, security and certainty in economic activities and it might improve transparency, motivation and incentives for long-term engagement in these economic activities.

The second category relates in a more practical manner to the utilisation and management of natural resources. The most important reasoning for the causal relationship between property rights and more specifically use rights on one hand, and the utilisation of natural resource for economic purposes on the other hand, is the following. If participants who utilise natural resources – as part of their economic activities – have a right to the means of production, exploitation of those means will logically be in the hands of those participants who undertake the risk and the effort. Therefore, these participants have the strongest interest in long-term and more sustainable forms of utilisation of natural resources. This implies that with correctly adopted use rights, markets presumably allocate the utilisation of natural resource more efficient, less costly and in a more productive manner. Effective use rights for the utilisation of natural resources make unlimited and unrestricted 'taking' of resources without consequences less likely to occur. With use rights, 'taking' is replaced by

'controlled utilisation', because the activities are coordinated and structured by those who manage natural resources[10] (Neill, 2007:3-9; Arnason, 2000:18). Charles specified the advantages of use rights for the 'utilisers' and 'managers' of natural resources in more detail. Use rights can aid those who are involved in management, by specifying and clarifying who participates in economic activities that directly utilise natural resources. Use rights can aid those who utilise natural resources – the participants or holders – by providing more security and transparency over access to the resource, the allowable set of inputs and outputs, the way in which the resource can be utilised, and for how long it is possible to utilise the resource. This security and transparency facilitates a more efficient and long-term planning of the utilisation of the resource by those who use the resource. Use rights that provide more security and transparency also reduce the likeliness of conflicts between different types of users that utilise the same natural resource (Charles, 2001:133-134). To sum up, use rights as a form of property rights, provide straightforward insight in who uses which resource where, how the resource will be used, and for how long. For those who utilise natural resources as an economic activity, use rights are likely to provide more security and transparency. They can also function as a way to force these participants to use the resource in a more responsible, long-term and sustainable manner. For those who are involved in the management of natural resources, use rights are an important instrument to plan, structure, control and coordinate the utilisation of these natural resources.

Review of the section

In this section, we have focussed on property rights. First, we looked at what property rights are. Property rights are institutions, because institutions are formal and informal rules. We found out that property rights are a set of rules that specify rights and obligations to possess, use or trade property. The characteristics of property rights can be split into six separate components: security, transferability, duration, exclusivity, flexibility and divisibility. Together, these elements assist in understanding how property rights function in practice. Considering types of property rights in relation to the theme of this thesis, it has been explained that use rights are the most relevant form. Use rights can be split up in access oriented and withdrawal oriented rights. Access oriented use rights can be split up in territorial use rights and limited entry rights. Withdrawal oriented use rights can be divided in 'quantitative input rights' and 'quantitative output rights'. In the real world, use rights are often a hybrid combination between these different forms of use rights. Lastly, we have analysed how property rights influence economic growth. In broad terms, a strong property rights system provides a basis for increasing order, stability, security and certainty in economic activities and it provides more transparency, motivation and incentives for long-term engagement in these economic activities. Use rights also provide more security and transparency for those who utilise a natural resource. Users are forced to utilise a resource in a more responsible, long-term and sustainable manner. For managers of natural resources, use rights are an important way to plan, structure, control and coordinate the utilisation of these natural resources.

3.5 Review of the chapter

In this chapter, we have been presenting the theoretical framework. The framework consists of a triangle of approaches; firstly the overall interaction between organisations and institutions through governance, secondly the participants in development through organisations, and thirdly the rules of development through property rights. Below, we will shortly review these three approaches.

The approach on interactive governance provided us three interrelated categories or 'orders' of governance. The first consists of solving problems and creating opportunities, the

[10] Consult for example Hardin (1968), with his theory of 'the tragedy of the commons'.

second deals with the creation of formal institutions, and the third is about guiding governance with principles. The second and third categories essentially facilitate the first category. We also distinguished self-governance, hierarchical governance, and co-governance, as three types of interactive governance. Self-governance is interaction through interference, hierarchical governance is interaction through intervention, and co-governance is interaction through interplay. Two broad approaches on the relation between governance and economic growth dominate the existing literature; market-enhanced governance and growth-enhanced governance. The first claims that there should be little interaction between the public and private sector, because the public sector will distort the functioning of the free market. The second perspective argues that economic growth can be achieved through interaction between the public and private sector; moreover the public sector can assist the private sector in becoming more efficient, competitive and profitable. The section ended with noticing that the interactive governance approach does not explicitly focus on organisations and institutions. Therefore, these concepts were elaborated in the continuing sections.

Considering organisations, we concentrated foremost on strategic interorganisational cooperation. The main reason for organisations to cooperate with one another is to achieve complex and long-term goals. Certain goals might be impossible to achieve by separate organisations; through strategic interorganisational cooperation new possibilities to utilise opportunities arise. Reasons for cooperation consist of accessing resources, creating economies of scale, sharing risks and costs, access to foreign markets, developing new products and services, collective learning, and collective lobbying. A network is a combination of organisations, working together to achieve common goals. Networks can be highly functional with a hub organisation. The latter can have a catalyst function when stimulating and inspiring other organisations with new ideas. Alliances can be regarded as a formal form of networks. The typical alliance is the trade association, in which organisations participate for generating and sharing knowledge, provision of advice, creating and implementing industry standards, collective lobbying and to speak with a powerful voice.

Property rights can be analysed through six different characteristics; security, transferability, duration, exclusivity, flexibility and divisibility. These characteristics assist in understanding how property rights function in the real world. For aquaculture and fisheries, use rights are the most relevant form of property rights. They can be split up in access rights, focusing on locations and entry of the activity. Withdrawal rights are related to possibilities and constraints of inputs and outputs. Property rights are important because they have the potential to create order, stability, security and certainty in economic activities and transactions and they might provide more transparency, motivation and incentives for long-term engagement in these economic activities. Those who utilise natural resource through use rights are likely to have more security and transparency in relation to their economic activities and the manner in which they utilise the resource is likely to be more responsible, long-term and sustainable. Use rights are also important for managing natural resources, in order to plan, structure, control and coordinate the related economic activities.

Chapter four

Methods and techniques of the research

4.1 Introduction

In this chapter, we are going to elaborate the methods and techniques of the research in more detail. In chapter two, the statement of the problem has been described. The 'Chilean Miracle' has become the key expression to refer to the sustained economic growth in Chile during the last 30 years. One of the sectors that contributes significantly to this economic growth is the salmon sector. Thus the main topic of this research is explaining the fast and sustained development of the salmon sector in Chile.

In this chapter, we are going to explain how the research was executed, where the research took place, and who was interviewed. In short, the aim of this chapter is to explain which tools were used in order to carry out the research.

First, the approach of the research is described, followed by a description of the research locations. The chapter continues with the methods of interviewing and sampling, and finishes with a review.

4.2 Approach of the research

The main research question concentrates on the factors that can explain the fast and sustained development of the salmon sector in Chile. As has been elaborated in chapter two, Chile managed to become the second largest salmon producer in the world within 25 years, generating almost US$ 2 billion, and employing more than 50,000 people (FAO, 2005b).

To answer the main research questions and the sub questions, a literature study is combined with a field study. The literature study took place from November 2006 until June 2007 and was used for three purposes. Firstly, the literature study was utilised to set up a theoretical framework (see chapter three). Secondly, it assisted in a general exploration of the subject of worldwide aquaculture and salmon cultivation in Chile (see chapters five and six). Thirdly, the literature study provided the information for two of the three themes; interactive governance and the interorganisational cooperation in relation to the Chilean salmon sector (see chapters seven and eight). The last theme, property rights, was partly researched with a literature study, and partly researched with interviews (see chapter nine).

The provision of relevant literature took place via contact persons such as scientists and experts from Chile and the Netherlands. Furthermore, the library of Wageningen University was consulted for articles and books. Local libraries in Chile were also consulted for news articles related to salmon cultivation. Lastly, the Internet served as a source for digital literature such as online journals. The field study in Chile took place from April to June 2007 and comprised observations and interviews.

This research is hybrid in several manners. First, it consists of both quantitative as qualitative data. This has been done because both perspectives complement each other. Their aggregate value is higher than when they are used separately. Moreover, choosing a perspective depends on the nature of the problem that we want to analyse. For example, when a bicycle is broken, we do not take a tool first and then start using it. When we use a hammer before knowing that the problem is a loose bolt, it is likely that the problem becomes even worse. Therefore, we need to analyse and understand the problem first, in order to choose the right tool to solve the problem. This is sound research: to look at the problem as objectively as possible and then choose the most suitable perspective for analysis. If we do not do this, we run the risk of drawing conclusions first, and then search for data that fits the conclusions.

Secondly, this research is also hybrid because of the utilisation of different disciplines. The core disciplines exist of law, but they are supported by other disciplines, such as political science, economics and sociology.

4.3 Research locations

The research location is the city of Puerto Montt, Region X, which is the core of the salmon cluster. However, it must be mentioned that Chilean salmon is produced in Regions X, XI and XII. Region X accounts for approximately 80% of the total production of salmon.

The fact that Puerto Montt is the core of the cluster, implies that all major salmon companies have an office in this city. Moreover, regional departments of the government are also located here, as well as a university, and several research institutes.



Figure 4.1:
Map of Latin America
Source: LF, 2005



Figure 4.2:
Map of Chile
Source: LF, 2005



Figure 4.3:
Map of salmon producing regions
Source: LF, 2005

4.4 Interviews

The specific aim of the interviews was to collect data for the chapter on property rights and concessions, and to combine this data with existing literature. A number of in-depth interviews were held with experts on aquaculture and salmon cultivation. Most of the respondents worked in Puerto Montt, but some of them also worked in Valparaíso, the city where the government is seated[11]. The background of the respondents is quite diverse: they were scientists from universities, independent lawyers or lawyers of agencies, employees of NGOs, editors, government officials from several public organisations, and experts of salmon companies.

Most of the interviews took place face to face, some of them took place by email, and others were held by telephone. About half of the interviews were in Spanish, the other half were in English. Translation of the interviews in Spanish has been done by the author of this thesis. Semi-structured interviews were used during the conversations, consisting firstly of a standard list of qualitative and quantitative oriented questions and secondly of a list of some broader topics for discussion.

[11] See appendix 1 for a list of the respondents.

The information from the interviews that will be presented in the following chapters is not linked to names of the persons that provided it, due to the wish of some respondents to stay anonymous.

4.5 Sampling

Two methods were used for sampling, which are closely related to the circumstances in the field. These circumstances are related to certain limitations. For example, people from salmon companies in Chile tend to be quite secretive and closed about the strategies of their company. They rather not talk about issues related to salmon production, especially concerning labour conditions and environmental impacts. In fact, most companies have a policy in which employees are ordered not to talk to any 'outsiders'. If they are approached anyway, they have to redirect this person to the producers association, SalmonChile.

The first method was snowball sampling; implying the utilisation of a small personal network of the author. The second method was the utilisation of Internet in order to find experts from companies or organisations. After that, these persons were approached by email, or their company or organisation was visited in order to make an appointment.

4.6 Review of the chapter

This thesis concentrates on explaining why the salmon sector in Chile has developed so fast. In this chapter, we have described the tools that were used to research the central subject of this thesis.

In the section on the approach of the research, we made clear that these tools consist of a literature study in combination with a field study. The literature study was used for constructing the theoretical framework, this framework consists of three perspectives that are the guidelines throughout this thesis; interactive governance, interorganisational cooperation, and property rights. The literature study was also used for exploring how interactive governance, interorganisational cooperation and property rights contributed to the development of the salmon sector. The field study assisted in researching how property rights function in practice.

The field work took place in the centre of the Chilean salmon cluster, which is the city of Puerto Montt in Region X. Semi-structured interviews were held with a variety of experts from salmon companies, governmental and non-governmental organisations, lawyer agencies and research institutes. Sampling took place through snowball sampling and the Internet for finding experts.

Chapter five

Introduction to aquaculture and salmon cultivation

5.1 Introduction

In this chapter, we will explore the general characteristic of worldwide aquaculture and we will focus on the production process of salmon. Thus, the aim of this chapter is to explore the subjects of aquaculture and salmon cultivation, so we are able to place the Chilean case into a broader, worldwide perspective. This makes it possible to understand in which international context the salmon sector in Chile develops. In this manner, we can focus on different levels of development on one hand, and on the other hand we can flexibly switch between these different levels, so we can understand how they interrelate. Moreover, one cannot discuss the guiding themes of interactive governance, interorganisational cooperation and property rights, without knowing anything about the subject to which it is applicable.

The chapter is organised as follows. First, we will focus on the general characteristics of aquaculture around the world. Among others, we will deal with the importance of aquaculture as human nutrition and on the environmental impact of the cultivation of carnivorous species. Secondly, we will concentrate on the key features of the production process of salmon. This is split up in the hatchery, grow-out, and processing phase. Lastly, we will review the chapter.

5.2 Worldwide aquaculture

In November 2006, an article was published in *Science* in which an international team of ecologists and economists stated that commercial fish and seafood species might collapse by the year 2048. This is caused by a loss of biodiversity and declines in water quality. According to the team, solutions to this problem are the creation of new marine reserves, sustainable management of fishing, and tighter control of pollution (Stokstad, 2006:745).

Naturally, these enactments are necessary in finding solutions for the decreasing biodiversity of oceans and seas. Surprisingly, the team did not mention aquaculture as part of these solutions. Commercial catch fisheries face fundamental constraints; production is variable, production is uncertain and production cannot be increased (Knapp, 2002 in Eagle *et al.*, 2003:4). Within aquaculture there is far greater control over the timing, consistency and quantity of production, compared to commercial catch fisheries (Eagle *et al.*, 2003:4). According to experts, aquaculture will provide the largest source of fish and shellfish for human consumption in the near future. Moreover, it is the fastest growing food production system worldwide (Tibbetts, 2001:A318).

We can regard aquaculture as controlled or semi-controlled production of aquatic animals and plants[12] (Stickney, 2000:vii). Considering finfish and shellfish, aquaculture involves enclosure in a secure system under conditions in which they can thrive. In relation to finfish, there is a deliberate intervention in fish life cycles, such as the exclusion of predators and the provision of feeding (Naylor *et al.*, 2000:1017).

Nowadays, aquaculture is a highly modernised industry. However, people already cultivated fish several millennia ago. In China, references are known of fish ponds, dating from 4,000 years ago. References on the cultivation of fish have also been found in Mesopotamia, about 3,500 years ago. During the era of the Roman Empire, fish farming was practiced in the Mediterranean region. Later on, it became part of the food production system of Christian Monasteries in central Europe (FAO, 2000:1 in Power, 2003:5).

[12] The production of plants as a part of aquaculture is excluded in this report.

Thus, aquaculture has been part of human life for several thousands of years. Nevertheless, the manner of production in aquaculture has dramatically changed over the last three decades. We will focus on these developments below.

In the late 1970s, the 'blue revolution' in aquaculture accelerated because of two reasons. First, due to the growing human population, experts worried that hundreds of millions of people could suffer malnutrition. Therefore, international agencies such as the World Bank began to encourage aquaculture in developing countries. The goal of such policies was to provide food for the poor and to promote economic development. A second reason is that China initiated structural economic reforms in order to encourage aquaculture (Tibbetts, 2001:A318). These reforms have made China the largest aquaculture producer in the world, with a production value of US$ 30 billion in 2004 (World Bank, 2006:99).

Table 5.1: World aquaculture production and value - Top 10 producing nations (total excluding aquatic plants; source: World Bank, 2006:99).

	Country	Production Tonnes	Percentage of Wrld production	Value (1000 US$)	Percentage of world value
1	China	30,614,968	67.3	30,869,519	48.7
2	India	2,472,335	5.4	2,936,479	4.6
3	Viet Nam	1,198,617	2.6	2,443,589	3.9
4	Thailand	1,172,866	2.6	1,586,626	2.5
5	Indonesia	1,045,051	2.3	1,993,240	3.1
6	Bangladesh	914,752	2.0	1,363,180	2.2
7	Japan	776,421	1.7	3,205,093	5.1
8	Chile	674,979	1.5	2,801,037	4.4
9	Norway	637,993	1.4	1,688,202	2.7
10	United States	606,549	1.3	907,004	1.4
	World total	45,468,356	100.0	63,356,429	100.0

Nowadays, 32% of the world fish production comes from aquaculture, 61% from marine resources and almost 7% from inland resources (see table 5.2). In 1963 aquacultural production was only 0.4% of the world fish production. This implies an increase of more than 2200% in forty years (FAO, 2005a:17). Currently, fish from farming activities accounts for more than 25% of the fish consumed by humans. With an expanding human population, the reliance on farmed fish as an important form of nutrition will also increase (Naylor *et al.*, 2000:1017).

Table 5.2: World fish production, live weight in million metric tones (source: FAO, 2005a:17)

	1963	2003	Increase in %
Marine	39	81	109
Inland	3	9	162
Aqua	2	42	2239
Total	44	132	202

The world wide aquaculture sector produces more than 220 species of finfish and shellfish. Finfish can be cultivated in freshwater, such as carp; they can also be cultivated in salt water in coastal areas. Examples are shrimp, salmon and trout. Shellfish are also cultivated in coastal areas, such as rope mussels and clams (Naylor *et al.*, 2000:1017).

As mentioned above, aquaculture might provide alternatives for capture fishing. Nevertheless, besides these chances there are also disadvantages that arise from

aquaculture. These problems mainly exist in those sectors that cultivate carnivorous species, such as salmon and trout.

For the preparation of the feeding of salmon and trout, fish and fish oil is needed, which creates a new pressure on marine resources. As Naylor *et al.* states, an average of 1.9 kilograms of wild fish is required to produce one kilogram of salmon (Naylor *et al.*, 2000:1019). Research shows however, that it is possible to replace fishmeal with other ingredients, including meals of plant origin. Moreover, some high-tech farms are now achieving a ratio of fishmeal in fish feeding of almost 1:1. Using proteins from plant origin is also problematic however, because the accumulation of Omega 3 fatty acids in salmon – a feature that makes it attractive as a healthy form of nutrition – is affected if fishmeal is replaced by other forms of protein in salmon feed (Forster, 1999:639; FAO, 2004a; World Bank, 2005:2).

Other environmental issues are the chemicals that are needed to remove lice from the fish, and chemicals for keeping the nets clean from wild shellfish such as mussels. Moreover, farmed fish are often treated with antibiotics to prevent them from getting diseases. Together these chemicals flush into the surrounding water and may do damage to the surrounding ecosystems. Reportedly, a 1,000 tonne salmon farm – small by current industry standards – produces sewage waste equivalent to a town of 20,000 people (Vellema & Van Notten, 2003:22).

Another problem is fish escapes. It is possible for instance, that escaped cultivated salmon breed with wild species. Cultivated species have the characteristic of growing fast and slow reproduction; wild species have the characteristics of growing slower and a faster reproduction. Therefore, breeding between cultivated and wild species might result in new species. These new species might have an impact on ecosystems of both rivers as oceans (see for example Soto & Moreno, 2001).

It can be concluded that especially those sectors within aquaculture that are responsible for these environmental issues need to invest in reducing their impact on their environment. This is not only important for the quality of the environment, but also for continuing their activities with support of critical NGOs and consumers. Indeed, an increasing responsibility in relation to the nutrition of humans has to be in balance with environmental responsibility.

5.3 The production process of farmed salmon

In this section, we will zoom in on the general characteristics of worldwide salmon cultivation. Within salmon farming, several different species can be cultivated. The majority of production is Atlantic salmon (*Salmo salar*); a minority of the production is Pacific salmon, with six different varieties. Of these six varieties, only Coho salmon (*Oncorhynchus kisutch*) and Chinook salmon (*Oncorhynchus tshawytscha*) are farmed in significant amounts. The other four species of Pacific salmon are Sockeye salmon (*Oncorhynchus nerka*), Pink salmon (*Oncorhynchus gorbuscha*), Chum salmon (*Oncorhynchus keta*) and Masu salmon (*Oncorhynchus masou*) (Bjørndal *et al.*, 2002:103; Bjørndal, 2001:2; Naylor & Burke, 2005:189; Hannesson, 2003:169).

The hatchery phase

We can distinct three different phases within the production process of salmon; the hatchery phase, the grow-out phase and the processing phase.

The hatchery phase begins with the artificial fertilisation of eggs from the female adult salmon with *milt* from the male adult salmon. The adult salmon have been carefully selected for productivity, quality of the product (colour) and the ability to resist diseases. Inoculation with vaccines or the adding of antibiotics to the feeding is used to prevent diseases. Furthermore, it is of utmost importance that the hatchery facility complies with high sanitary standards to ensure that the young salmon are not infected before they leave. This is also relevant in relation to the fact that hatcheries are often located in remote areas near sources

of fresh water. Diseases on a hatchery can possibly contaminate the fresh water environment (Weber, 1997:11-12; UNCTAD, 2006:13-14)

Once the eggs are fertilised, they are placed in hatcheries filled with oxygenated freshwater. How quickly eggs hatch and their rate of survival depends foremost on water temperatures and oxygen levels. On average, the eggs are kept in freshwater between 4°C and 8°C, raised to 10°C for eyed eggs to speed up hatching. Hatched eggs are called *alevins*, which are exposed only to dim light. The reason for this is that bright light cause *alevins* to use their energy for hiding from the light, rather than for growing. One stage further, *alevins* emerge as *parr* and they are ready to be moved to freshwater tanks. This is also the stage in which feeding must begin. The round tanks can differ in size, but on average, they are 3 to 4 meters in diameter and one meter in depth. Water inside these tanks is continuously circulated; this is comparable to the natural circumstances in a river where wild young salmon grow up. An alternative for tanks are lake cage systems; however, conditions are less controllable in this situation. The density of production depends foremost on which system is used; intensive systems can maintain *parr* at densities of 50 kg/m^3 or higher. After a period of 8 to 16 months, the *smolts* are approximately 8 to 12 centimetre in length and weight between 40 and 120 grams. Now they are ready to be shipped to a controlled seawater environment, where the grow-out phase can begin. The transfer between freshwater and seawater usually takes place in special transport tanks. The transport itself can be done by any combination of road, helicopters and by sea in specialised boats with large pumps that circulate seawater (Weber, 1997:11-12; Phyne & Mansilla, 2003:113-114; UNCTAD, 2006:13-14; FAO, 2004a).



Figure 5.1: A salmon hatchery in Scotland (source: ATC, 2006)

The grow-out phase

This phase takes place in sheltered bays of the ocean, in cages that consist of large nets. These systems often have a floating walkway and are anchored to the seabed. Cages can differ in size and shape; some are circular and others are square, while cages can be 400 m^2 or even larger. The depth of the nets can reach 15 to 20 meters, with a total water volume of several thousands of cubic meters. The stocking densities of these nets can be up to 20 kg/m^3 (FAO, 2004a; Weber, 1997:12).

During the last three decades, the sizes of cultivation cages have increased significantly, from 7 by 7 meters to 20 by 20 meters nowadays. The materials for the construction of the cages are also replaced. During the 1980s and 1990s, they were made of wood, nowadays they are made of aluminium and high-impact plastic. Sea farming sites often exist of several cages that are grouped together. The selection of these sites takes place on their suitability with regard to seawater temperatures, salinity, currents and tides, the supply of well oxygenated water, proximity to other farms or wild fisheries and in compliance with local licensing regulations (UNCTAD, 2006:14; FAO, 2004a).

The feeding of salmon exists of substances that stimulate rapid growth. The main ingredients are fishmeal and fish oil. Furthermore, carotenoid pigments are often added in order to produce salmon with the flesh colour that the market demands. If necessary, antibiotics can be added to the feeding. The usage of fishmeal and fish oil is controversial since it causes pressure on wild fish stocks. Therefore, the industry has made large investments in research on feeding, but also on breeding and fish health management. On a global scale, the ratio of fishmeal in fish feeding fell from 70% in 1972 to 35% in 2002. In the early 1980s three kilograms of fish was needed to produce one kilogram of salmon; nowadays however, high-tech salmon farms are able to reduce this ratio to almost 1:1. Moreover, the amount of feed required to grow salmon to maturity fell by 44% in the same

period. But innovations have not stopped at the feeding itself. Many salmon farms now use computerised systems for a tailor-made feeding program. The newest systems can even detect when fish have finished feeding. In this manner, the fish can be fed to satiation without overfeeding. This reduces the production costs and the amount of uneaten feed that falls down on the seabed (UNCTAD, 2006:14; Economist, 2003; Aerni, 2004:331; FAO, 2004a).

The salmon will be harvested before they reach sexual maturity. This happens because the quality of the flesh deteriorates and consequently the salmon is no longer suitable for human consumption. Harvest generally takes place after a period of 12 to 18 months, when the salmon weigh between 2 and 7 kilograms. An important factor for growth is also the water temperature. About 3 to 4 days before slaughter, the salmon are starved in order to empty the gut, reduce fat, and firm the flesh. The process of harvesting is aimed at keeping stress to a minimum; in this manner, the quality reduction of the flesh is also kept to a minimum. The fish can be collected in several ways; with large baskets, with sweep nets or with pumps. They are either transported alive by well-boat to the processing plant or they are slaughtered on the side of the cages. Usually the salmon are killed by tranquilising with carbon dioxide or soft brine. After harvest, it is a good practice to wait for a period of at least 6 weeks or more before the introduction of a new generation of salmon (Weber, 1997:12; FAO, 2004a).

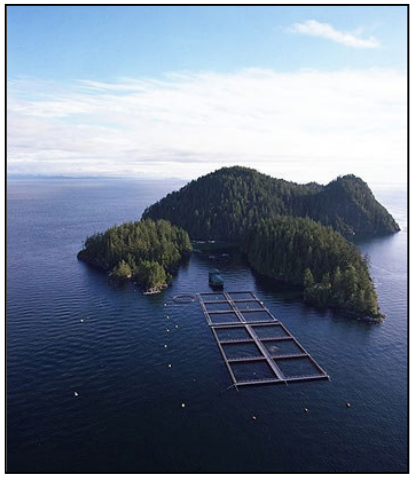


Figure 5.2: A salmon farm in British Columbia, Canada (source: ASG, 2006)

The processing phase

This is the most labour intensive phase in the production of salmon, because full automation of this part of the process is not possible. During this phase, the harvested salmon can be processed into different products. Atlantic salmon can be frozen for sale as whole frozen salmon or as fresh gutted salmon. However, most of the fish are processed as fresh fillet or reserved for smoking. These forms of processing are also applicable to the Pacific varieties of Coho, Sockeye and Chinook. The Pacific varieties of Pink and Chum salmon are used for canning and salting (Bjørndal *et al.*, 2002:107; Power, 2003:1).

Hygiene and phyto-sanitary conditions on the processing plant are highly important due to international standards. These standards are also relevant in relation to demands considering product weight, colour, size, shape and packaging. Well-trained workers and high standard equipment are inevitable in meeting these standards. Products and processing facilities are certified by authorities from the United States, the European Union, and Japan when exporting to these markets. Therefore, most processing plants do have solid cold chains, international standards of germ control (HACCP) and efficient systems of waste management (World Bank, 2005:4; UNCTAD, 2006:14-15).



Figure 5.3: A processing plant near Puerto Montt, Chile (source: ELAW, 2005)

When the three phases of the production cycle have been completed, the salmon product is ready for transportation. Those countries who are large salmon producers have now subcontracted the transportation service. This allows firms to focus solely on the core business of producing salmon. However, these transportation firms again have to comply

with international hygienic standards. Advanced technologies and management techniques are used to meet these standards and to reduce overall costs (UNCTAD, 2006:14-15).

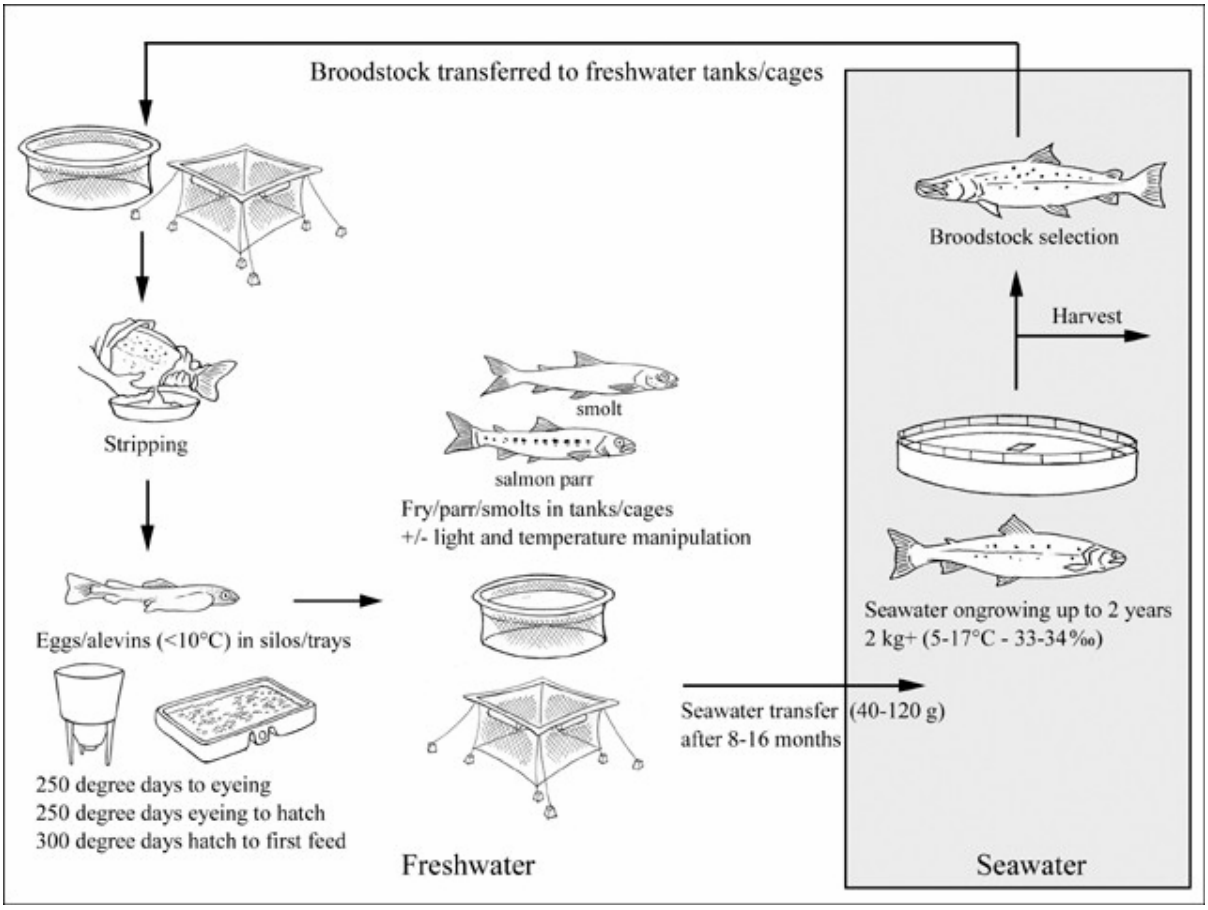


Figure 5.4: Production cycle of farmed salmon (source: FAO, 2004a)

Production costs

If we look at the total production cycle (see also figure 5.4 above) and the production costs, it appears that costs vary between countries and farms. They mainly depend on the size of the farm, the geographic and hydrographic location of the farm, the political situation in the specific country and the influence of different levels of government considering regulations and policy. The Norwegian government for example, has continuously supported aquaculture in general and has invested in research and development of the sector. Other important factors in the production costs are the availability and costs of raw materials such as feed and fish and operation costs in relation to infrastructure. Lastly, production costs are also influenced by the costs for labour (FAO, 2004a; Bjørndal, 2001).

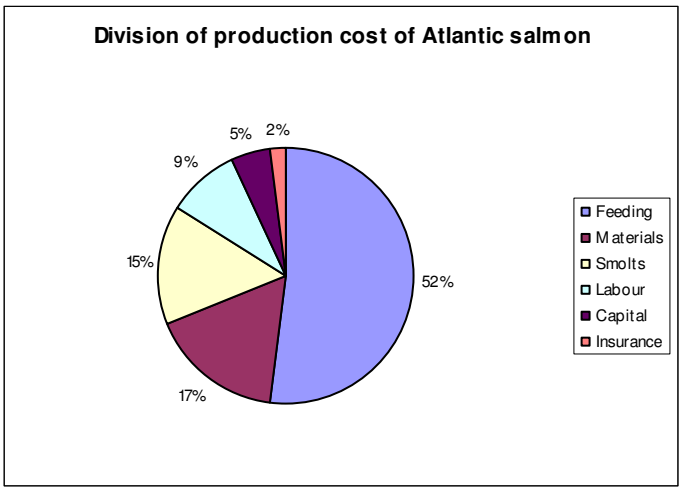


Figure 5.5: Average division of production costs of Atlantic salmon (source: Bjørndal et al, 2002:108)

Table 5.3: Production costs of Atlantic salmon in 2004 (source: USDL, 2005; G&A, 2006:iii-16; FAO, 2004a)

	US$/kg	Wage/hour in US$
Norway	2.30	34.64
Chile	1.85	03.00
Canada	2.60	21.42
United Kingdom	2.50	24.71

5.4 Review of the chapter

In this chapter, we have analysed aquaculture in general, and the process of salmon cultivation in specific. We have seen that aquaculture is certainly not a new activity of the last decades; it has been practised for thousands of years. The difference with contemporary aquaculture lies in the scale and intensity of production: in the last 40 years, worldwide aquaculture has grown more than 2000%. It also became clear that the cultivation of carnivorous species such as salmon and trout can have a considerable impact on the environment. These problems exist of escapes, diseases, and chemicals and antibiotics that flush out. Moreover, to produce one kilogram of salmon, at least 1.9 kilogram of wild fish is needed to make fishmeal and oil. Therefore, aquaculture of carnivorous species only has a future when these problems are solved, through more responsible and effective production methods.

We also analysed the production process of salmon. The cycle consists of three phases; the hatchery, the grow-out and the processing phase. Overall, the cultivation of salmon takes between 20 to 30 months. Considering production costs, it became clear that feeding accounts for more than half of these costs. Moreover, we have also seen that the wages in processing plants differ considerably between countries: for example, in Chile labour is 10 times cheaper than in Norway.

Chapter six

The development of the salmon sector in Chile

6.1 Introduction

In this chapter, we will zoom in on the development of the salmon sector in Chile. The goal of this part of the thesis is to generally describe and understand how the sector developed in the course of time.

This development is split up into four phases: the experimental phase, the industrial initiation phase, the industrial expansion phase, and the market expansion phase[13]. After these four phases, we will concentrate on the contemporary characteristics of this sector, and we will have a short look into the future. In the last section we will review the chapter.

6.2 Experimental phase, 1878-1973

The earliest attempts to introduce aquaculture in Chile date from the late 19th century. These were private initiatives, related to recreational fishing. Two businessmen, Tomás Urmenta and Isidora Goyenechea de Cousiño, carried out the first attempts to cultivate salmon in the Chilean rivers in the year 1878. Until 1904, several Chilean citizens also experimented with exotic species such as carp and trout. However, their efforts did not produce any significant results. However, the Chilean government became interested and in 1904, the first public hatchery was constructed, resulting in the hatching of German brown trout and Atlantic salmon eggs one year later. This hatchery was owned by the Chilean government and several universities, with the intention of promoting and encouraging recreational fishing. Between 1905 and 1910, more private and public initiatives were established in the Aconcagua and Maullín basins. From 1921 onwards, in the southern areas of the country, new introductions of several species of salmon took place. The public Institute of Fishing Promotion (IFOP), a department of the Agency for Economic Development (CORFO), led most of these activities. During the next decades, other public agencies such as the Agricultural and Stockbreeding Service (SAG) and the Marine Authority became involved in these experiments. From the 1960s onwards, these institutes combined their efforts in order to become more productive in salmon cultivation. Apart from Chilean experts, foreign experts were increasingly involved, with the aim of further development. Cooperation agreements were signed between two universities from the United States (Oregon State University and the University of Washington) and the two Chilean institutes IFOP and CORFO. The aim of these agreements was to find out what the possibilities were for fish farming in Chile, to identify suitable locations for fish farms, and to develop the necessary facilities for this form of aquaculture. The latter consisted of the establishment of salmon incubation facilities and breeding programmes. Other international organisations were also approached, such as the Peace Corps from the United States and the Japanese International Cooperation Agency (JICA). This resulted in a cooperation agreement in 1969 with JICA, with the long-term goal to introduce Pacific salmon in Chile. Cooperation mainly concentrated on human resource development, achievability and technical studies, and exploring the economic viability of salmon cultivation. More concretely, JICA donated a fish exploration boat and agreed to introduce Pacific salmon, resulting in the import of 40 million eggs and the seeding of 26 million avelines. In 1971, the first experimental cages for salmon farming were built.

[13] The division in these four phases is based on UNCTAD, 2006

In short, until 1973, the Chilean State directed the cooperation between several actors for the development of salmon cultivation, but this did not yet result in commercial salmon farming (Iizuka, 2003:14; Niklitschek *et al.,* 2005:4; SUBPESCA, 2003:5; Våge, 2005:44-45; SalmonChile, 2007a; UNCTAD, 2006:5; Basulto del Campo, 2003:40 in Våge, 2005:44).

6.3 Industrial initiation phase, 1973-1986

The military regime that took over power in 1973, planned to diversify the Chilean economy, because it was too dependent on fluctuating copper prices. Under this economic policy, salmon cultivation became one of the ways to achieve this, together with other sectors such as fruit, wine, and timber. Suddenly, the importance of salmon cultivation had changed; consequently, the experimental phase needed to be transformed in concrete results and thus in commercial production. However, the new sectors had to develop within the competitiveness of the newly introduced neoliberal market system. Because of orthodox neoliberal policies, these new export sectors had a somewhat difficult time to develop, but this changed when the military regime decided to introduce a more pragmatic approach[14].

In 1974, the first private company was founded with clear commercial purposes to cultivate rainbow trout, called the Society of Fishery Pisciculture of Lake Llanquihue. The founders of this company were graduated fishing engineers from the Catholic University of Valparaíso. Moreover, the fact that Chile had a large number of skilled engineers and managers, trained in public universities in the previous decades, was to become a highly important factor in the development of the Chilean salmon sector. Considering financial aspects, the company was made possible through a loan provided by CORFO. In 1978, the efforts of this company resulted in the export of the first 80 tons to France. In the next years, exports increased slowly, delivering to other countries in Europe and the United States. The prices of the product were relatively high in this period, which started to attract the attention of other seafood-linked companies. One of them was Union Carbide, a company of the United States. It already cultivated salmon in its own country, and became interested in starting activities in Chile. Therefore, it created the company Domsea Farms Chile in 1974, and started to produce small amounts of salmon on the island of Chiloé in Region X, using imported genetic material. In 1977, Union Carbide also constructed a pisciculture centre, laying the foundations for sea ranching (Våge, 2005:45; Iizuka, 2004:10; Agosin, 1999:94; Katz, 2004:10). An important factor that made these first exports possible was an adequate infrastructure. As Agosin (1999:94) states, without the infrastructure such as large ports, an international airport, and the north-south highway, exports of salmon could not have started. It must be mentioned that much of these infrastructure projects were initiated in the 1960s.

In 1979, the Japanese company Nichiro Chile introduced a new methodology, which was closed culture, implying the cultivation of salmon in tanks and then in cages connected to rafts. Nichiro Chile had learned to use this technique, through technological advances in Norway and Scotland. In the following years, most of the new salmon companies adopted the techniques of Nichiro Chile. However, in that time, there were no providers of materials, and therefore this company was self-sufficient in the provision and construction of cages. The small-scale and hand-made solutions of this period characterises a mentality of learning by doing (Våge, 2005:46; Iizuka, 2004:11; Agosin, 1999:95).

The military government reacted on the starting of the industrial phase by creating the Sub-secretariat of Fishery and the National Fishery Service in 1976, both belonging to the Ministry of Economy, Development and Reconstruction. SUBPESCA was charged with the strategies and policies towards aquaculture and fisheries in general, and SERNAPESCA was charged with the implementation and enforcement. The flexible legal framework was in place in 1980s and was slowly but continuously improved (Iizuka, 2004:10; Katz, 2004:10).

[14] See chapter seven on governance and the development of new export sectors.

The regime also created a new public-private institute created in 1975, called Fundanción Chile. In 1981, this organisation bought Domsea Farms Chile and created the company Salmones Antarctica, with the goal of showing interested businesspeople how to cultivate salmon on a large scale (Katz, 2004:10; Agosin, 1999:95). The governmental organisation CORFO continued to support local firms to initiate in fish farming, by providing loans. Lastly, the military regime also created the new planning office SERPLAC for the specific support of aquaculture development (Iizuka, 2004:10). Especially the efforts of Fundación Chile are nowadays recognised to have been crucially and catalytic for the development of the salmon sector in Chile[15].

As a result of the combined efforts of public, public-private and private parties, the salmon sector started to develop. In the beginning of the industrial initiation phase there where only a couple of salmon companies, producing around 100 metric tons, but by 1986 there were 36 companies, producing 1,200 metric tons, worth over US$ 1 million. For the first time, Chile was acknowledged as a salmon producer in the world (Perez-Aleman, 2005:666; Niklitschek *et al.,* 2005:4; Iizuka, 2004:11, Technopress, 2003 in Iizuka, 2004:11).

6.4 Industrial expansion phase, 1986-1996

One of the most important events of this phase, was the establishment of the Association of Salmon and Trout Producers (La Asociación de la Industria del Salmón y Trucha de Chile A.G, or SalmonChile) in 1986, by 17 national salmon producers. Again, it was Fundación Chile which came up with this idea, and pushed the producers to cooperate. Initially, the main goal of this new private organisation was to cooperate in marketing strategies and to create a quality certification system. In other words, a new institutional framework was established in order to coordinate the productive relations and utilise the new ideas and experiences of salmon companies. In 1993, SalmonChile also created a special department, called the Salmon Technology Institute (INTESAL), with the aim of dealing with problems such as diseases (Maggi Campos, 2004:4; Iizuka, 2003:15; Iizuka, 2004:12; Perez-Aleman, 2005:667).

The cooperation in marketing strategy worked well, also because the Chilean government started to establish free trade agreements from the 1990s onwards. Apart from the standard markets of the United States, Europe, and Japan, this resulted in the opening of new markets, such as Argentina (1991), Mexico (1992), Venezuela (1995), Colombia (1996), Taiwan (1994), Thailand (1994), Singapore (1995) and China (1997). These new markets were not only important because of the increasing exports, but also because of more diversification (Iizuka, 2004:13; Maggi, 2002 and SalmonChile, 2003 in Iizuka, 2004:13).

The cooperation considering quality control was also crucial. The salmon companies of SalmonChile developed the 'Code of Standards for Chilean Salmon', defining how to evaluate each stage of the production process. Later on, these standards were adapted by the public organisation of SERNAPESCA, charged with the control and inspection regulated in the legal framework (Achurra, 1995 in Perez-Aleman, 2005:667; Montero *et al*., 2000 in Perez-Aleman, 2005:668).

With this new cooperation, we can signal an important new development considering the expansion of the salmon sector. There was a consensus that in order to be competitive with other large producers such as Norway, Canada and Scotland, individual and isolated acting by Chilean salmon companies was not possible. Indeed, right from the beginning of the recognition of being a world producer, Chilean producers joined forces so they could deal with sector wide problems such as marketing, quality control, and diseases.

In this phase, CORFO supported the creation of a quality certification system financially and technologically, however, SalmonChile was the one that took the initiatives.

[15] Consult chapter eight for a more detailed description of the involved organisations.

Fundación Chile expanded their efforts in relation to the salmon sector, by organising excursions to other leading salmon producing countries and the establishment of special teams occupied with technological improvements such as pathology and pen constructions, again in close cooperation with Chilean and foreign experts. Fundación Chile also organised seminars on salmon cultivation in Chile and other countries, and through its company Technopress it also released an important magazine called Aqua. Furthermore, this public-private organisation launched a new company named Huillinco, which was pioneering in working with Atlantic salmon in Chile. And lastly, Fundación Chile stationed international representatives in Japan, Norway, Scotland and the United States, with the purpose of promoting and marketing the Chilean salmon (Iizuka, 2004:12; UNCTAD, 2006:7).

By now, it has become clear that there was not only flexible and dynamic cooperation *within* the separate private, public-private and public parties, there was also a good cooperation *between* these parties.

Right in the beginning of the first democratically chosen government of Aylwin, the need for a coherent legal framework, specifically dealing with aquaculture, was recognised. In 1991, the General Law on Fishery and Aquaculture (LGPA) was promulgated, and in the following years the regulations of LGPA were implemented[16]. To deal specifically with aquaculture, a special department was created within the Sub-secretariat of Fishery. Moreover, with LGPA an important framework was introduced in relation to the utilisation of the national common goods. Concessions were introduced for using the marine areas, and authorisations were introduced for pisciculture on land. To make this legal system function in practise, SUBPESCA created Appropriate Areas for Aquaculture (AAA), implying the specific assignment of zones in which aquaculture could develop[17]. As will become clear in this thesis, this legal framework would prove to be one of the crucial factors in providing certainty, security and stability in the development of the salmon sector.

With the new democratic government, the public approach towards the private sector started to change. Under the Pinochet regime, the government continuously and actively supported the salmon sector through technological, strategic and financial programmes. However, the sector was rapidly "growing up" and therefore it became strong enough to "stand on its own feet". This implied that the government realised that they could step back, through which their strategy changed from an active practical support in an active dialogue with the sector.

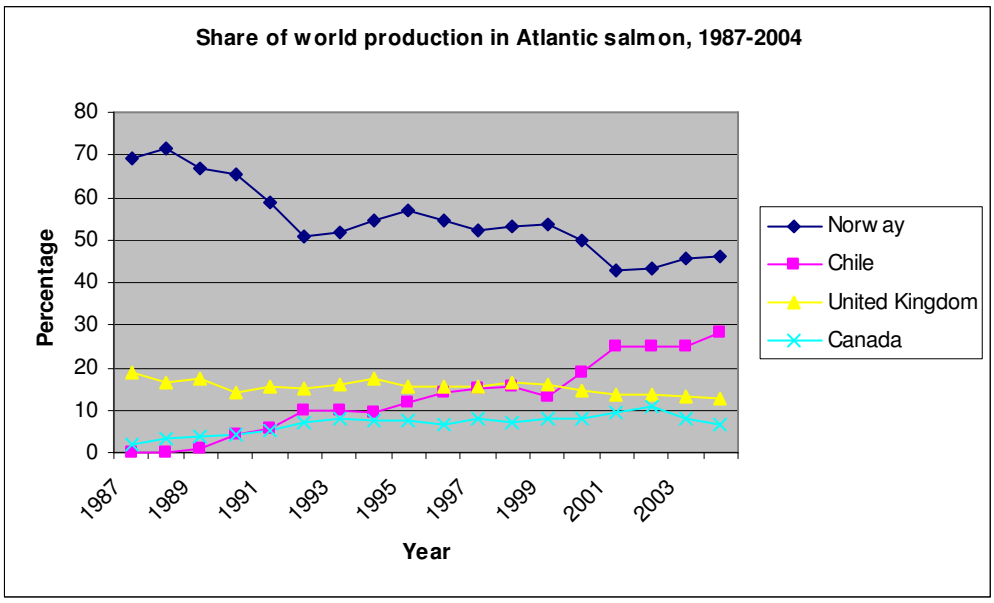


Figure 6.1: Share in world production of Atlantic salmon for Norway, Chile, UK, and Canada, 1987-2004 (source: FAO, 2005b).

[16] This section is based on the General Law on Fishery and Aquaculture (SUBPESCA, 1991)
[17] Consult chapter nine for a more detailed analysis of concessions of aquaculture.

During the industrial expansion phase – and especially around 1990 – many new salmon companies were established and the sector started to grow explosively. Figure 6.1 makes clear that by 1991, Chile had surpassed Canada in the production of Atlantic salmon. By the end of this phase, there were 56 salmon companies, producing almost 100,000 metric tons of varied salmon species (Iizuka, 2004:11; FAO, 2005b; Aqua Noticias, 1999 in Våge, 2005:48).

6.5 Market expansion phase, 1996–2007

During this period, the most striking differences can be observed in the increasing size of companies and production; at the same time, the number of companies decreased. Between 1992 and 1999 for example, the number of companies decreased from 63 to 40, but the production per company increased from an average of 790 to almost 5500 metric tons (see table 6.1). The origins of these companies are both Chilean as foreign; however, the number of foreign companies has been increasing during the last decade. Undoubtedly, these trends are directly related to the Chilean bulk production, lowering world prices of salmon and increasing competitiveness among salmon companies. Moreover, the low world prices of salmon created an increasing demand of salmon by consumers around the world, strengthened by a decreasing supply of wild salmon and meat diseases such as BSE and foot and mouth disease (UNCTAD, 2006:7).

Table 6.1: Number of salmon companies in Chile and their production (source: Aquanoticias, 1999 in Våge, 2005:48)

	1992	1993	1994	1995	1996	1997	1998	1999
Number of companies	63	60	58	56	55	48	45	40
Production in metric tons per company	790	1102	1316	1745	2460	3336	4036	5447

By the year 2000, Chile had surpassed the United Kingdom considering the production of Atlantic salmon. It had become the second largest producer of salmon in the world, and between 1990 and 2000 it achieved an impressive growth of more than 1,600% (FAO, 2005b; see also figure 6.2 on the next page).

Another important characteristic of this phase is the emergence of a salmon cluster around the city of Puerto Montt, in Region X, where 80% of the salmon production takes place. As one expert explained, salmon companies started to ‘cooperate to compete’, implying that on a national level, salmon companies are competing, but on an international level, they are joining their forces.

The Chilean salmon cluster is growing rapidly, considering salmon production, but also considering specialised production of materials, transport and other services. The core of the cluster consists of more than 500 cultivation centres, 34 processing companies and almost 150 direct suppliers. More than 100 companies linked to the salmon sector are located in this area. For example, in 2006 there were 22 companies producing salmon cages for mariculture, 13 companies delivering maintenance services, 18 companies producing and maintaining pisciculture tanks and 10 companies providing pathological services (Pietrobelli & Rabellotti, 2004:86; UNCTAD, 2006:7). Considering the public-private sector, the cluster is supported by Fundación Chile and several other research institutes, all located in the same region. The public sector is represented by governmental organisations such as SUBPESCA, SERNAPESCA, and CONAMA, who also have regional offices. Moreover, there are a number of public universities carrying out a variance of research projects related to salmon cultivation.

6.6 Present and future of the sector

After only 30 years, Chile has been building up a salmon sector that is now the second largest producer in the world, exporting US$ 1.7 billion worth of salmon in 2005, and accounting for just over 70% of total aquaculture exports. Between 1990 and 2004, the production of Atlantic salmon – the dominant farmed specie – increased from 10,000 to 350,000 metric tonnes, implying an increase of 3,500% in only 14 years[18]. The industry is highly concentrated, with 11 companies producing 80% of all Chilean salmon. By now, the industry is by far the most important provider of employment in Region X, generating approximately 50,000 direct and indirect jobs. Moreover, the inventor of cluster theory, Porter, has claimed that the Chilean salmon cluster is one of the greatest and strongest in Chile (SalmonChile, 2006; SalmonChile, 2007; ISB Research, 2005 in G&A, 2006:37; Iizuka, 2003:14; FAO, 2005b).

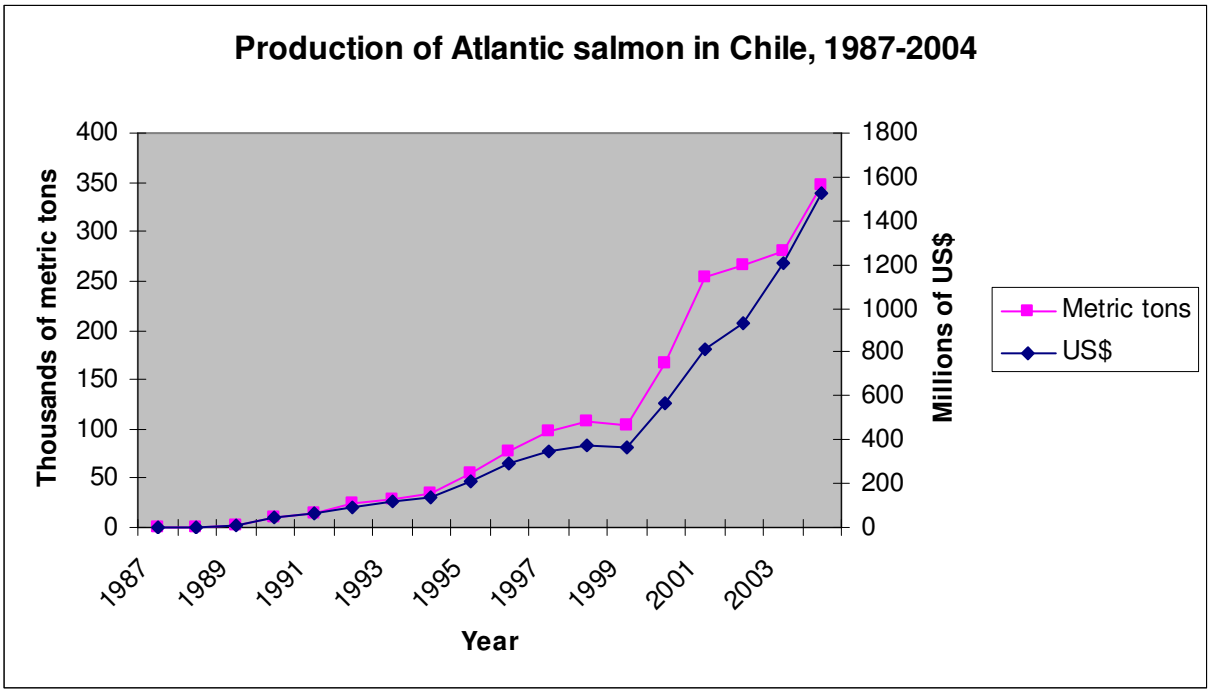


Figure 6.2: Production of Atlantic salmon in Chile, in metric tons and US$ (source: FAO, 2005b)

Within 10 years, it is expected that Chile will become the number one salmon producer in the world, surpassing Norway. According to the National Aquaculture Policy (PNA) of 2003, Chile is planning to double its salmon production between 2003 and 2013. To do this, the plan recognises the need of exploring and opening new markets, especially those of China and Brazil, due to the increasing incomes and urbanisation in these countries. Moreover, the PNA considers the necessity of simpler procedures for concessions, a more efficient cooperation with other users of the coastal zone, and a shift to Region XI (area of Aysén) in order to provide the industry with new aquaculture zones (SUBPESCA, 2003; FAO, 2004b:21-43).

Table 6.2: Planned salmon production in Chile, 2003 – 2030 (source: FAO, 2004b:23)

Year	Planned production in metric tons
2003	450,000
2010	757,000
2013	900,000
2020	1,348,000
2030	2,403,000

[18] Consult appendixes 2, 3, 4 and 5 for statistics on worldwide and country specific salmon production.

6.7 Review of the chapter

This chapter aimed to analyse the general development of the salmon sector in Chile. We have seen that the first attempts to introduce new species in this country took place more than 100 years ago. However, it was not until the 1960s that experiments and explorations of the possibilities were intensified by public organisations. The analysis made clear that important projects of infrastructure were started in the 1960s, such as seaports, airports, and the north-south highway. Moreover, in the same period, many engineers and expert were educated in Chile and abroad, assisting in R&D many years later. In spite of the existence of research programmes, infrastructure, and availability of human resources, there was however no commercial production at this time. Nevertheless, they would prove to be crucial as a foundation for the industrial initiation.

The military regime of Pinochet aimed at diversifying the Chilean economy within a neoliberal model. Suddenly, the creation of a salmon sector fulfilled an important role in achieving this goal. But the regime realised relatively late that the new industry needed their support in order to become a truly competitive and grownup industry. The industrial initiation stage (1973-1986) was characterised by the willingness of new entrepreneurs to take risks and invest in the new salmon sector. There was an open atmosphere, in which learning by doing was very important. Especially when the regime implemented a more pragmatic neoliberal model after the economical crisis in 1982, public and private parties flexibly cooperated with each other in other to make large-scale salmon cultivation possible. Within this cooperation, Fundación Chile played a crucial and pivotal role by being a pioneer in technological research. Moreover, there was not only flexible and dynamic cooperation *within* the separate private, public-private and public parties; there was also a good cooperation *between* these parties.

In the industrial expansion stage (1986-1996) was characterised by the establishment of the producers association SalmonChile, focussing on marketing and promotion on one hand, and on quality control on the other. This resulted in the exploration of many new foreign markets, and a quality certification system that was later adopted by the government. In 1991, just after the introduction of the first democratic government, a new legal framework was established that specifically dealt with aquaculture. Firstly, the General Law of Fishery and Aquaculture provided in users rights of the national common good, called concessions. Secondly, to make these concessions practically implementable, LGPA created aquaculture zones.

In the last stage of market expansion (1996-1997), production of salmon increased rapidly, produced by fewer but larger Chilean and foreign companies. This resulted in the creation of one of the most important and largest clusters in Chile, consisting of 500 salmon farms, 34 processing companies and almost 150 direct suppliers.

Today, the salmon sector of Chile is the second largest in the world. It provides more than 50,000 direct and indirect jobs, and generates more than US$ 1.7 billion worth of exports. Remarkably, between 1990 and 2004, the sector achieved a growth of more than 3,500%. Within the next 10 years, Chile plans to become the number salmon producer in the world, by opening up new markets and the provision of more aquaculture areas in the south of the country.

Chapter seven

The (in)visible hand of the Chilean Miracle

7.1 Introduction

As mentioned in the introduction, it was the conservative economist Milton Friedman of the University of Chicago, who pronounced the orthodox neoliberal policies of General Pinochet's military regime to be "an economic miracle" in 1982 (Cypher, 2004).

In this chapter, we will further investigate the Chilean Miracle. The aim is to explore the influence of governance on economic growth during the different political arenas of the last 40 years[19]. By doing this, we are able to understand in which economical and political context the new export sectors of Chile developed, and how their development was influenced by governance processes. It will become clear that the development of the salmon sector, as described in chapter six, does not stand on its own. Under an incrementally evolved macroeconomic policy, many other sectors arose throughout the last 30 years, such as the wine, fruit and timber sectors.

We will not analyse the economical and political developments from solely a developmental or structural approach, nor from solely a neoliberal or monetarist approach. We will not seduce ourselves to choose an old-fashioned positivism approach or a post-modernistic approach. We want to analyse with a broad view, not narrow minded. Choosing one of these perspectives is to start with a conclusion, and then start to collect the information that supports the conclusion. To understand the complexities of development processes in a globalising world, broad, multi-discipline, and open-minded approaches are needed.

The chapter is organised as follows. In the first section, we will focus on the governments of Frei and Allende, from 1964 to 1973. The emphasis will be laid on expropriation, property rights and import substitution industrialisation. In the second section we will concentrate on the military regime of Pinochet, from 1973 to 1990. Here, specific attention is paid to neoliberal policies, privatisation, and coordinated development. In the third section, the democratic coalitions of the *Concertación* is being handled, from 1990 to 2006. In this part we are going to look at free trade agreements, new interactive governance strategies of the government, and the dialogue between public and private parties in order to increase economic growth. In the last section of the chapter, it is shown that the rise of new export sectors in Chile, based on the utilisation of natural resources, was not exclusively the result of the invisible hand of the free-market, but rather of a slow learning process in which eventually the right balance was found between neoliberalism and coordinated development.

7.2 Expropriation and import substitution: Frei and Allende, 1964-1973

Expropriation under Frei and Allende

In 1964, Eduardo Frei from the Christian Democrat Party was elected as the new president of Chile. Under the 'Revolution in Liberty' programme, the Frei government aimed at revitalising the economy through land reforms. The ultimate goal of Frei was a state-led redistribution of agricultural property, benefiting the landless and poor rural households. Agricultural production was ought to become of a cooperative type (*asentamiento*), in combination with incentives based on efficiency, in order to stimulate a controlled process of

[19] This chapter relates to section 3.2 of the theoretical framework in chapter three, that deals with the theoretical aspects of interactive governance.

capitalist modernisation (Bellisario, 2007:2-8; Taylor, 2002:49; Silva & Plankey Videla, 1991:15).

Frei stated that:

> "Property must be maintained and respected, but it should be socially regulated. The exercise of a property right that infringes upon the common good and the rights of the community cannot exist. When this occurs, the fundamental norm that the common good must precede individual rights has been broken, and it is essential, then, that the State reorganizes, regulates and redistributes these property rights to avoid this abuse." (Chile, 1965:13 in Bellisario, 2007:8)

Thus, the former and undesirable structure of agriculture was perceived to negatively affect the performance of the Chilean economy. According to the view of the Frei government, the capitalist structure of property rights of 'our lands and waters is one the main deterrents hindering the general process of economic, social and political development of our country' (Chile, 1965:4 in Bellisario, 2007:9).

Frei's vision on the redistribution of property, and therefore the redistribution of wealth, became legislated in 1967 under Law 16.640. It must be mentioned however, that this Agrarian Reform Law was initiated in 1962, under the Alessandri government. The 1967 law provided a framework for agrarian restructuring, and charged the Corporation of Agrarian Reform (CORA) with the implementation of the new law. Land reform was also made possible through the Chilean constitution, which permitted expropriation of private assets at less than market value. While the process of expropriation of land had started slowly and on a minor scale in 1965, it was intensified between 1967 and 1973. Hence, the Frei government focused foremost on agriculture – expropriating only inefficient estates – and mining (Bellisario, 2007:8; Jarvis *et al.,* 2004:5-16; Keech, 2004:26; Valdés, 1995 in Peppelenbos, 2005:81; Taylor, 2002:49).

Predictably, under the landless and poor classes of society the law was warmly welcomed, however, the influential classes that actually owned large areas of land saw the law as unjust acting by the government and as a threat of their dominant interest. Indeed, many property holders in Chile experienced the reforms as traumatising (Bellisario, 2007:8; Jarvis *et al.,* 2004:16; Keech, 2004:7-18). Hence, the first seeds for unrest in the Chilean society were sown. The legitimacy of the Frei government became undermined, offering new opportunities for a new government.

In 1973, the socialist government of Allende was democratically elected. Contrary to Frei's government, the Popular Unity government aimed at creating a socialist economy, but under the framework of a capitalist parliamentary democracy. Society was to be based on collective ownership, rejecting the coalition of hierarchy and fatalism, and attempting to install an egalitarian order. An important way to achieve this was to involve the masses in decision-making processes of the government (Peppelenbos, 2005:83). After the elections, the Popular Unity government mentioned:

> "A new historical development in which *el pueblo* (the people) had arrived to power through positing a bold proposal for radical change that would affect the forms of everyday life, the institutional organization, and the relations of production: preparing the road for the constitution of a new society" (ODEPLAN 1971:15 in Bellisario, 2007:2-12)

Another text in one of the plans of the new government confirmed that it was indeed aiming at a revolution:

> "The main policy objective of the Popular Unity government is to replace the present economic structure, ending the power of national and foreign monopoly capital and *latifundia*[20], to initiate the construction of socialism…" (The Popular Unity government's Plan for the National Economy, in Bellisario, 2007:12)

[20] Large private agricultural area, opposite from the *asentamiento.*

Allende's government stated that four main structural problems had been obstructing the development of the Chilean society (Bellisario, 2007:12):

1. High dependency on foreign markets
2. Extreme concentration of property and income
3. High rates of socio-economic and political marginality
4. The orientation of the economy to satisfy the preferences of high-income groups

In short, the Allende government concluded that on one hand the reforms needed to take place through a reinforced programme of a new distribution of property, in order to counter the monopolistic control over the means of national production. Under the governments of Frei and Allende, between 1964 and 1973, this resulted in the expropriation of 59% of the total Chilean land, accounting for almost 10 million hectares (see table 7.1). Most of this land existed of large *latifundias*. The expropriation was not only limited to agriculture; most companies, mines, banks, wholesalers, export firms and 'strategic industries' were nationalised. By the end of 1971, over 150 industries were put under state control, including twelve of the twenty largest industrial firms in the country (Bellisario, 2007:13-15; Jarvis *et al.,* 2004:6; Peppelenbos, 2005:83; Stallings, 1978:130-132 in Keech, 2004:27; Larraín & Meller, 1991:188-189 in Keech, 2004:27)

On the other hand, Allende concluded that the domestic industries needed stronger protection through a reinforced programme of import substitution industrialisation. This issue is discussed in the section below.

Table 7.1: Distribution of expropriated land, in hectares, 1964-1973 (source: ODEPA, 1974:II in Bellisario, 2007:15)

Categories	*Chile's total*	*Expropriated*	*Percentage*
Irrigated land	1,243,628	729,459	58.7
Arable dry land	3,535,481	1,500,888	42.5
Non-arable dry land	11,978,102	7,735,522	64.6
Total	16,757,211	9,965,868	59.5

Import substitution industrialisation under Frei and Allende

During most of the 20th century, the Chilean economy depended very much on mineral exports. First the dependency was related with nitrate, but when alternative chemical fertilisers were invented, exports decreased rapidly. Copper became the dominant export product, accounting for 80% of the national export income in the 1960s and 1970s. Thus, the Chilean economy was directly linked with the regular fluctuations in the prices of copper. This led to problems considering the national balance of payments, and consequently it strongly influenced the government budget. As a solution for protecting the economy from these problems, Chile has been adopting an import substitution[21] strategy, which started during the late 1940s in a subtle manner, and slowly became more important in the 1950s and 1960s (Moran 1989:492; Agosin, 1999:82).

According to the dominant economic views in the 1960s, import substitution industrialisation was a rational alternative in the absence of export earnings, which had been decreasing since the world depression of the 1930s. Chile, like a number of other Latin American countries, had been exporting primary products and importing industrial products. However, these countries did not have enough foreign exchange to continue to import. In short, advocates of import substitution industrialisation argued that Chile should stop exporting natural resources such as copper, in relation to falling world prices, and stop importing machinery and consumer products, in relation to rising world prices. Instead, it would be

[21] The import substitution industrialisation theory was developed by Prebisch (1949) and Singer (1964)

better to develop domestic industries and an internal market. To make this possible, infant industries should be supported through a tariff wall, based on a Keynesian-style state intervention programme. Naturally, this is a normal response if foreign markets become too expensive. Moreover, it would have been less problematic if the import substitution industrialisation in Chile was not characterised by monopolies and inefficiency (Keech, 2004:18; Cypher, 2004; Taylor, 2002:47). The general characteristics and consequences of import substitution industrialisation are (Huang, 2002:30):

- Protection of domestic industries under high tariffs or import quotas
- The inefficient use of resources on the short term
- Lack of development of scale economies
- Fostering of an inward looking attitude
- Promotion of activities in which the country begins with a comparative disadvantage

Consequences of the policies of Frei and Allende

As mentioned above, the expropriation policies of Frei and Allende were welcomed by the lower classes, and condemned by the higher classes in Chilean society. The expropriation process of the government was chaotic and caused declining productivity and sell-outs. The insecurity of private property forced businessmen to freeze investments, sell inventory at speculative prices and invest in hard currency, causing a lack of technological discoveries and innovations in the 1960s. The consequence was growing polarisation and radicalisation between rich and poor groups, and between leftist and rightist groups (Bauer, 1997:642; Peppelenbos, 2005:83; Agosin & Bravo-Ortega, 2006:8; Valdés,1995 in Peppelenbos, 2005:84).

Moreover, the import substitution strategy failed, because the government of Allende could not achieve political stability and coherence in its policies. The protection of the domestic industrial sector discriminated against export goods in general and more specific against agricultural productivity. Within three years, the state doubled its control over the economy to 60% of the GDP. As a consequence, the domestic currency became overvalued and even stronger restrictions on imports were implemented. Lastly, due to very costly system of taxes and subsidies, the budget of the Allende government showed very serious deficits (Moran 1989:492; Peppelenbos, 2005:83).

The combination of these factors caused a total chaos in Chile by 1973. The country plunged into economic decay with a huge inflation of more than 600% (see table 7.2), causing strikes, protests, guerrilla opposition, and violence (Carruthers, 2001:345).

Table 7.2: Macroeconomic performance in Chile, 1970-1973 (source: Larraín & Meller, 1991:200 in Keech, 2004:47)

	1970	1971	1972	1973
Growth of GDP	3.6	8.0	-0.1	-4.3
Inflation	36.1	22.1	260.5	605.1
Unemployment	5.7	3.8	3.1	4.8
Increase of real wage	8.5	22.3	-11.3	-38.6

Many authors that have written about the Allende and Pinochet period, point at Allende to have provided the foundations for the military coup in 1973. However, we can conclude from the literature that it was not only the Allende government that caused chaos in Chilean society. The policies in relation to expropriation and import substitution industrialisation were not new; there were only intensified. It is true however, that the economical, political and societal chaos in Chile of 1973 provided the ideal situation for the military to take over, under the harsh and disciplined leadership of General Augusto Pinochet.

7.3 Neoliberalism and coordinated development: Pinochet, 1973-1990

A forceful and radical new era in Chile
On 11 September 1973, a new era started in Chile, in a political, economical and ideological sense. The military government of General Augusto Pinochet harshly overthrew the democratically elected government of president Allende, in order to forcefully and radically restructure the Chilean society. Almost one decade before the revolutions of Thatcher and Reagan, the Pinochet regime introduced a pioneering doctrine: neoliberalism, implying a minimised but strong state and a maximised scope for individual freedom. The latter must be regarded as contradictory in the case of Chile, since this doctrine was cruelly implemented. According to official numbers, 3,197 people were killed for political reasons, including 1,102 people who disappeared after being arrested by Pinochet's security forces (Agosin, 1999:80; Carruthers, 2001:345; Peppelenbos, 2005:85; Rettig, 1991 in Lahera, 2000:1091).

In essence, both Frei and Allende on one hand, and the Pinochet regime on the other hand, signalled the same weakness of Chile: the high dependency on copper, making the Chilean economy vulnerable for fluctuations in world copper prices. The difference lies in their visions of dealing with this problem.

Frei and Allende regarded import substitution industrialisation as the right paradigm, building a domestic economical market through state-driven economic development. The Pinochet regime regarded neoliberalism as the right paradigm, building an open, free-market economy, in which the state would play a minor role.

This implied that by far the most important goal to be achieved during the period 1973-1990, was to diversify the Chilean economy, with neoliberalism as the ultimate cornerstone of the economical policy. According to the regime, diversification of the Chilean economy should take place by utilising Chile's comparative advantages, of which the most important are the climate in combination with land and water resources.

In contrast to the ruling orthodox neoliberal view that many have of the Pinochet period, it will become clear below that the Pinochet regime actively coordinated the development of new, competitive export sectors, based on the utilisation of natural resources[22].

Important to mention, is that the junta of generals and admirals that took over power, did not have a long-term economical plan to achieve their diversification goal. Indeed, the decision-making process was not based on clear and definitive choices. It was characterised by hesitation, policy contradiction, shifting priorities and incremental choices (Keech, 2004:35; Valdés, 1995:16; Kurtz, 1999:399). This will become clear in the sections below, where we will handle the three policy periods of the Pinochet regime, each of them characterised by a distinct economic policy.

Because the Pinochet regime lacked a clear economical vision in the beginning, a number of economists were asked to assist. Most of these experts had their roots in the 'Chicago School', well known because of its neoliberal economists like Milton Friedman and Arnold Harberger. Already in the 1950s, the Chicago University and the Universidad Católica de Chile started an exchange programme. The Chicago University sent professors in economics to Chile and accepted Chilean graduate students. The economists that returned became professors at universities, worked for the government or joined large firms in Chile. In spite of the diversity of their jobs, they shared the same orthodox neoliberal vision, the same technical language, had a highly rationalistic approach to problem solving, and were eager to contribute to the new society of Chile. These economists are currently known as the 'Chicago Boys'[23] (Carruthers, 2001:345; Luders in Valdés, 1995:18). Thus, in essence, the Chicago Boys advocated the principles of laissez-faire and monetarism. They came up with

[22] See for example Agosin, 1999; Bellisario, 2007; Jarvis *et al.,* 2004; Kurtz, 2001; Schurman, 1996a
[23] See appendix 6 for a list of the Chicago Boys and their positions in the Pinochet government.

four measures for the restructuring of the Chilean economy (Gutierrez de Pineres & Ferrantino, 1997:378; Huang, 2002:7):

1. Counteract the slow growth of GDP
2. Put a hold to the huge inflation
3. Rectify the declining flows of trade
4. Remove the controls from the capital market

These four measures make clear that in the vision of the Chicago Boys, Frei and Allende had maintained disastrous economic policies. The import substitution policies had made Chilean industries inefficient and uncompetitive, because a large and weak state apparatus controlled them, and because the production of these industries was not meant to be competitive with world markets. Moreover, according to the Chicago Boys, the policies of Frei and Allende towards private property rights were also disastrous, because they had caused insecurity and destabilisation towards new investments and therefore these policies were an obstruction to the national economic development.

Again, these neoliberal reforms – masterminded by the Chicago Boys – have to be seen in relation to the broader goal of making the Chilean economy less dependent on fluctuating world copper prices by creating new competitive export-led sectors. In the vision of the Chicago Boys this would strengthen and diversify the Chilean economy, and consequently bring stability and prosperity to the country as a whole.

Thus, the most important reform policies carried out by the military government – with the assistance of the Chicago Boys – were concentrated on dismantling the state-driven import substitution industrialisation and to develop a competitive free-market economy based on creating new export sectors (Bellisario, 2007:16). We will now handle the three different periods – gradual, radical and pragmatic neoliberal policies – in which these measures were implemented[24].

First phase: gradual neoliberalism, 1973-1975

In this first phase, the emphasis of the Pinochet regime was on stimulating exports through major shifts in economic policy. After all, the economy and society as a whole was in a crisis: there were shortages, huge inflation, no private investment, foreign reserves were gone, and fiscal deficit was more than 30% of GDP (Agosin, 1999:88; Kurtz, 1999:405-407).

One of the first measures was to reduce protection by reducing the high tariffs of the Allende government. This reduction was not introduced abruptly. Instead, it was applied in a gradual manner, to avoid a huge shock for the already weak economy. Fixed-asset producers were the most important economical actors and they had difficulty with fast economic adjustment. According to Pinochet, an orthodox neoliberal approach would have produced “a strong [increase in] unemployment and the suspension of numerous basic public works that the country cannot cancel without its future development”. In other words, the gradualist approach probably offered the best option for economical recovering. Just before the coup, the average tariff was 94%, with 57 different rates, ranging from 0% to 220%. Between 1973 and 1979 tariffs were gradually reduced to low uniform tariff of 10% (Agosin, 1999:88; Kurtz, 1999:405-408; Gwynne, 1993:149; E. Silva, 1993:556-557; Ffrench-Davis, 2002:137).

The coup also brought an end to land expropriation and the new regime started to give the agriculture sector stimulations to become more competitive. Apart from reducing the tariffs, property rights reforms – especially in agriculture – were regarded to be one of the most urgent tasks of the government. The reforms included fortifying private property rights, assuring individual titles to expropriated land, encouraging an agricultural land market, reducing the state’s role in production and regularise the vast amount of unproductive agricultural land owned by the state. During 1974 and 1975, the regime cancelled the

[24] The division in three different economic policy periods comes from E. Silva, 1993.

expropriation records of 1736 estates – covering 26% of the expropriated land – and gave it back to the original owners. In this period, new reform programmes were designed to privatise other industries, including the electricity and telephone companies. However, copper, oil and several other key state enterprises were not privatised. In the second phase of the regime, some of these reforms were transformed into new laws in order to secure private property against the intrusions of the state (Bauer, 1997:642; Richards, 1997:155; Bellisario, 2007:16-18; Cypher, 2004).

In this first phase, the regime started to promote new export sectors. A new trade promotion department was created in 1975, within the Ministry of Foreign Affairs. The new department was called ProChile[25] and it promoted the formation of alliances between agro industrial companies and assisted these companies in exploring the unknown foreign markets. This was done – among others - through 32 offices located in other countries that carried out market studies and collected trade information that would be of interest to exporters (Agosin, 1999:94-95; Perez-Aleman, 2003:796).

Fundación Chile[26], a public-private organisation, founded in 1976 and dedicated to the development of sectors, by means of technological transference and diffusion. Fundación Chile looked for technology in other countries, tried it in Chile, and if it was interesting it would spread this technology as widely as possible (Våge, 2005:95).

Second phase: orthodox neoliberalism, 1975-1982

In 1975, the military regime agreed to introduce a set of severe fiscal and monetary measures, and to intensify the measures that it had introduced in the first phase. The trade liberalisation programme slowly became more radical between 1975 and 1982. However, it must be mentioned that decision-making processes were still short-run and iterative. The new measures included the elimination of non-tariff barriers, the unification of the multiple exchange rates into a single rate in order to favour exporters, the decontrol of many domestic prices, privatisation of banks and the establishment of new private lending institutions with decontrolled interest rates. To promote economic competition, the barriers for entering banking and financial activities were considerably reduced. Privatisation reforms continued until 1980, with only 15 firms remaining in the public sector, out of the 500 state controlled companies of the Allende government (Gwynne, 1993:149; Agosin, 1999:88-89; Kurtz, 1999:411-418; Gutierrez de Pineres & Ferrantino, 1997:378; Huang, 2002:8).

In 1979, General Pinochet declared that the process of economic reconstruction was complete and that the process of 'modernisation' would begin. By now, the rate of inflation was reduced from 600% in 1973 to below 10%. The average annual rate of economic growth in this phase was almost 8%. Moreover, the budget deficit – being nearly 25% of GDP in 1973 – now showed a small surplus. Export and trade increased substantially in this period, with an annual growth of 12%. Remarkably, the composition of exports had changed significantly. In the 1960s and 1970s, copper accounted for 80% of the export earnings, but in 1980 copper represented only 46% of all exports. Other newly created exports existed of seafood (6%), agricultural products (6%), and forestry products (13%). Thus, one of the most important economic policies of the military regime – diversifying the Chilean economy – was actually working (Kurtz, 1999:414-416; Huang, 2002:10; Fischer, 2001:4).

The completing of economic reconstruction also implied the finishing of the agrarian reform in 1981. By now, one third of the land was returned to the former landowners. Around 40% of the land was allocated to peasants in the form of individual and private family farms. Another 16% of the expropriated land of Frei and Allende was auctioned to private companies and individuals. Lastly, almost 9% was handed over to public or non-profit organisations. Crucially, after the land reforms the government ensured the security of private property in

[25] See chapter eight for a more detailed description of ProChile.
[26] Consult chapter eight for more information on Fundación Chile.

the 1980 constitution. This guarantee for private property proved to be essential for renewed investments in agriculture (Bellisario, 2007:24; Jarvis *et al.,* 2004:16).

Third phase: pragmatic neoliberalism, 1982-1990

The growth in the second period caused great optimism within the military regime, convincing the Chicago Boys that their neoliberal vision was the right one. However, in 1982 the Chilean economy fell from optimism into a deep crisis. GDP fell with more than 14%, 810 companies went bankrupt, and debts surged (Huang, 2002:12).

The crisis was caused by both internal policy mistakes, as external shocks. It became clear that the timing and speed of the implementation of the economic reforms were weakening the Chilean economy. On one hand, liberalisation of the domestic capital market was considered to be an important cause of the crisis, because the lack of regulation and control made the financial system unstable. On the other hand, low interest rates in the United States had made the loaning of money very cheap in the second half of the 1970s. This caused financial speculation in Latin America, and therefore also in Chile. In fact, this was an important factor for the uplifting of the Chilean economy during the mid 1970s. In 1982, the U.S.A was facing economical problems due to increasing inflation, and therefore the interest rates were raised significantly. This caused a reduction in foreign credits, and a huge increase of the costs for debts (Huang, 2002:13; E. Silva, 1993:557).

To cope with the crisis, the regime approached the IMF, seeking emergency assistance. As a consequence, Chile was forced to adjust its neoliberal economic policies. A stabilisation programme was introduced in combination with more proactive public policies. This included abandoning the fixed exchange rate with the dollar, and subsequently a daily devaluation policy was maintained. Real wages were reduced by almost 20%, giving an impulse to the profitability of export firms, and causing the involvement of more labour in the production process. The new reforms also included a new, more practical and more realistic trade reform, reintroducing a degree of protection for import goods and new incentives for non-traditional export goods. These last changes were also demanded by the private sector, asking to be involved in the policy-making process. Crucially, this led to a more dynamic and flexible interaction between public and private parties, considering the design and implementation of economic policies. Thus, there was a clear and necessary shift from an orthodox to a pragmatic neoliberal policy (Ffrench-Davis, 2002:136; Huang, 2002:14; Gutierrez de Pineres & Ferrantino, 1997:379; Kurtz, 1999:420).

From 1985 until the end of the ruling period of the military regime in 1990, the national economic situation in Chile stabilised and achieved a high growth rate. A consistent macroeconomic policy had emerged, characterised by managing an effective exchange rate and promoting export growth. More specifically, the stimulation of exports took place through an elimination of the stamp tax on exports, special credit programmes for exporters (Kurtz, 1999:421; Gwynne, 1993:149).

By 1990, the some of the most important goals of the regime were achieved. A neoliberal economy was introduced, being far less dependent on copper, due to the diversification with new export sectors. As a result, non-traditional exports of agriculture, fishing, manufacturing and forestry products more than doubled between 1984 and 1990 – from US$ 1.6 billion to US$ 3.8 billion[27] (Gwynne, 1993:149).

It is unavoidable to observe that only after a pragmatic neoliberal was in place – between 1982 and 1990 – Chile really achieved steady economic growth. The military regime, economically advised by the Chicago Boys, had slowly but certain learned to find the right balance in their economic policies. It had created a free-market system in which the government actively promoted new export sectors. This happened through economical measures such as tariff drawbacks for exporters, subsidies for new exports, the involvement

[27] See appendix 7 for a graphical breakdown of non-mineral exports and GDP in Chile, 1964-1990.

of private parties in the policy-making process, the provision of credits, and information providing through explorations of new markets and technologies, carried out by state or semi-state organisations. In short, the economic policies had incrementally evolved in a hybrid combination between pragmatic neoliberalism and coordinated development.

7.4 Free-market democracy: Concertación, 1990-2006

The transition from the military regime to the democracy was subtle and happened without any violence. The new paradigm of the *Concertación* – the centre-left coalition governing Chile since 1990 – became economic growth with social equity. Thus, the three governments of Aylwin (1990-1994), Frei Ruiz-Tagle (1994-2000) and Lagos (2000-2006) have continued the successful hybrid combination of pragmatic neoliberalism with coordinated development, basing their strategy on continuity considering neoliberalism and change considering democratisation. These governments have been known for their coherency across policy areas, relative transparency and efficiency in policy schemes and regulations, fiscal discipline and cautious debt management, avoiding manipulation of fiscal policy for political purposes, and being the least corrupt government in Latin America and one of the least corrupt governments in the world (Bellisario, 2007:4; Fernández Jilberto, 2004:203-204; Lahera & Cabezas, 2000:1096; Aninat *et al.,* 2006:8-43).

One of the crucial aspects of the *Concertación* economic policy is the signing of free trade agreements with the United States, the European Union, Korea, China, Mexico, most Latin American countries, and Japan. Chile is also a member of the World Trade Organisation (WTO), the Free Trade Area of the Americas (FTAA), and the Latin American Mercado Común del Sur (MERCOSUR). Partly due to these agreements, Chile has one of the freest economies in the world. Moreover, the agreements are considered to be a very important factor in the growth of new export sectors[28] (Agosin & Bravo-Ortega, 2006:29; FAO, 2006; Aninat *et al.,* 2006:11).

Since the 1990s, trade promotion activities of the government have been further increased. Companies were encouraged to work together in associations in order to combine their forces in promoting their products, and to undertake activities for the generating of more knowledge of their markets. Therefore, Export Committees have been established that carry out overseas activities, and they are subsidised for a maximum of six years (Agosin, 1999:94).

The government also started new business development strategies, such as the Small and Medium sized Enterprise Support Programme (Programa de Apoyo a la Pequeña y Mediana Empresa). This programme provides instruments to correct market failures and to improve the efficiency, productivity, competitiveness and international trading position of Chilean small and medium sized enterprises. Another business development strategy of the government is the National Fund for Technological Development and Productive Research (FONTEC), created in 1991. Chilean companies can ask for the assistance of FONTEC, that intends to promote, guide, finance and subsidize the implementation of technological research, development, and infrastructure (Alarcón & Stumpo, 2001:167-173).

Public and private parties also invested time, money and energy in order to improve their relations and establish a formal dialogue. Due to this dialogue, the *Concertación* guaranteed Chilean businessmen the sanctity of private property, to maintain the economic model on the long term, and make no dramatic changes to the social structures in Chile. Moreover, this public-private dialogue made it possible to maintain economic policies that could be flexibly adapted to the needs of Chilean firms (Taylor, 2002:57).

[28] Consult appendix 8 for a graphical breakdown of trade liberalisation in Chile.

As a result of the effective combination of pragmatic neoliberal policies with coordinated development, the Chilean economy has been growing steadily since the introduction of democracy, with an annual growth rate varying between 4% and 8%. Since 1990, minimum wages increased by 80%, annual inflation has been reduced from 27% to 3% in 2005, GDP has more than doubled, and average household expenditure increased by 170% (Huang, 2002:15-20; Schmidt-Hebbel, 2005:5; Halpern, 2002 in Peppelenbos, 2005:89).

Undoubtedly, these successes are strongly related to the robust growth of new export sectors. Production for the export of fruit, timber, and seafood has expanded dramatically to achieve the same goal as the Pinochet regime: diversifying the Chilean economy in order to become less dependent on fluctuating copper prices.

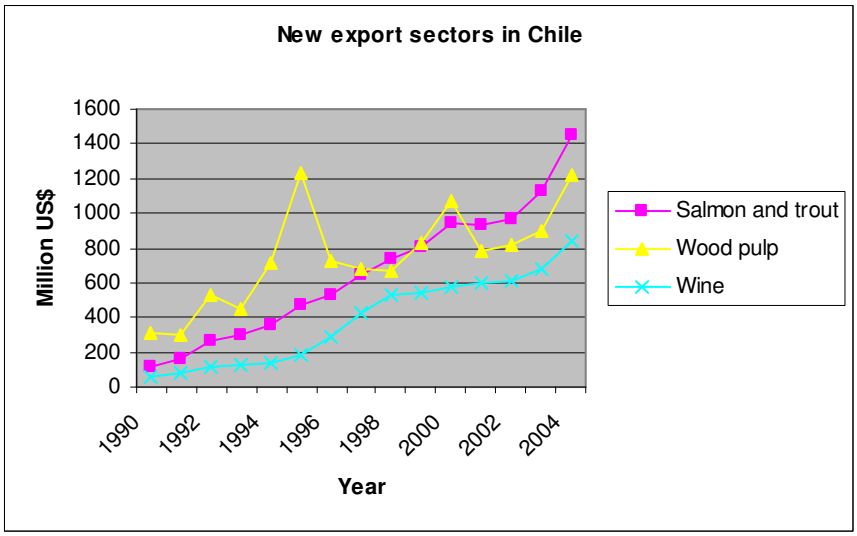


Figure 7.1: New export sectors in Chile (source: Sofofa, 2005)

7.5 Review of the chapter

In this chapter, we have analysed three periods in relation to the economical and political developments in Chile. This has been done to understand why the salmon sector was developed, and in which context it was developed.

The period 1964 to 1973 of the governments of Frei and Allende can be characterised as follows. Frei and Allende both recognised the problem that Chile was very dependent on copper. In essence, the problem was that the Chilean economy was very vulnerable to fluctuating world copper prices. They advocated that expropriation of property and import substitution industrialisation were the solutions in order to solve this problem. Thus, the aim was to create a nationalised and state-controlled domestic market. The result was disastrous; the insecurity of property rights caused a freeze of investments, and the import substitution industrialisation negatively influenced competitiveness because productivity became inefficient. These effects caused polarisation in Chilean society, and a huge economical crisis. In other words, in 1973, the country was in total chaos.

This chaos was used by the Pinochet regime to take over power, from 1973 to 1990. This military regime – economically advised by the Chicago Boys – signalled the same problem as Frei and Allende: Chile was too dependent on copper and therefore the economy was very vulnerable. However, they came up with exactly the opposite solution: to create a neoliberal economy, in which the free market dominated and the state played a small but strong role. The most important strategies were to secure private property rights and to diversify the Chilean economy through the creation of new export sectors, utilising the country's wealthy natural resources. The regime never had a clear plan for this; in fact, it slowly learned, by trial and error, to find the right mix of policies for achieving their goals. Thus, after the crisis of 1982, the economic policies had incrementally evolved in a hybrid combination between pragmatic neoliberalism and coordinated development. This might imply that the economic crisis of 1982 has possibly played an important role in forcing the

Chilean government to adopt a more interactive oriented governance approach, in order to create public-private partnerships as the main strategy for economic development.

From 1990 to 2006, the democratically chosen and centre-left *Concertación*, continued the economic model of Pinochet, in combination with more social equity. This coalition managed to sign a number of important free trade agreements. Moreover, it developed new business strategies in order to promote the new export sectors. The *Concertación* also continued and intensified the dialogue with Chilean firms, so that economic policies could be adjusted to the needs of these firms. In short, the *Concertación* successfully continued and intensified the model of the military regime, based on a hybrid combination between pragmatic neoliberalism and coordinated development. As a result, the newly created export sectors have expanded and flourished, such as for example the salmon sector.

We can conclude that when Friedman pronounced Chile to be an economic miracle in 1982 – as a result of neoliberalism – he was wrong, in two ways. Firstly, the economic success of 1975 to 1982 to which he referred, was based on the favourable external condition of low interest rates in the United States; this was proved by the 1982 crisis, in which it became clear that orthodox neoliberalism had failed. Secondly, the real Chilean Miracle was created after the 1982 crisis as a direct result of economic policies that were incrementally evolved in a hybrid combination between pragmatic neoliberalism and coordinated development.

Chapter eight

Strategic interorganisational cooperation

8.1 Introduction

In this chapter, we are focussing on the organisations that are involved in the Chilean salmon sector. Note that this chapter links up with section 3.3 of the theoretical framework in chapter three, which deals with strategic interorganisational cooperation. The aim of this chapter is to identify the key organisations that have contributed to the development of the salmon sector.

The chapter is organised as follows. First, we will look at the public organisation of ProChile, that is responsible for export promotion of Chile's new export sectors. Secondly, we are focussing on the provision of funds, by the public organisation of CORFO. Thirdly, we are focussing on the transfer of technology by the public-private organisation of Fundación Chile. Lastly, we are going to describe the private organisation of SalmonChile, which is the salmon producers association. The chapter finishes with a review on the aggregate value of these cooperating organisations.

8.2 Export promotion – ProChile

The public organisation of ProChile (Dirección de Promoción de Exportaciones or Directorate of Export Promotion) was created in 1975 under the neoliberal program of the military regime. The organisation is a department of the General Directorate of International Economic Relations of the Ministry of Foreign Affairs. The overall objective of the General Directorate is to create and implement the trade policy of Chile. The objective of ProChile is the promotion and diversification of export products and the opening up of new markets, with special attention to non-traditional export sectors, such as wine, timber and salmon (Alarcón & Stumpo, 2001:176; ProChile, 2007). Between 1975 and 1982, ProChile was operating on a relatively small scale, due to the neoliberal vision of the regime, implying little state intervention in the functioning of the free market. The crisis of 1982 forced the regime to adjust the radical neoliberal programme to be more gradual. From this moment onwards, the importance of ProChile increased significantly (Perez-Aleman, 2000:47).

The functioning of ProChile is based on four basic concepts: the support to small and medium enterprises in the process of internationalisation; the utilisation of opportunities that arise from free trade agreements; the facilitation of cooperation between public and private organisations, and the positioning of the international commercial image of Chile in other markets. In order to achieve its goals, ProChile uses internal and external strategies. Internal strategies focus on the direct assisting of firms that are operating in new export sectors, external strategies focus on the promotion of sectors abroad. To facilitate the external strategy, ProChile has a network of offices in important export countries. Nowadays, in 2007, this network consists of 58 trade offices in 40 countries. The facilitation of the internal strategy takes place through services to small and medium enterprises on three areas; market orientation, commercial promotion, and information technology (ProChile, 2007; Frohmann, 2007:21).

Another part of the internal strategy is to coordinate the formation of groups of firms in sectors. This takes place through a key unit of ProChile, which is the Export Promotion Fund (Fondo de Promoción de Exportaciones or FPE). These alliances are formed to assist firms in learning how to improve the quality of their products and to meet international standards, in combination with researching production practices and to explore new possibilities for introducing new products on the world market. Through the department of FPE, ProChile co-finances export projects proposed by sector specific committees that are representing the alliances of firms. Only firms that operate in groups can obtain financing; individual financing is not possible. Per definition, FPE finances 50% of the approved export

projects, the participating firms are paying the other 50%. The budget of FPE increased steadily from approximately US$ 5 million annually in the 1980s, to approximately US$ 7 million in the 1990s and nowadays its budget is more than US$ 10 million per year. Especially considering this funding, ProChile and CORFO are closely working together (Perez-Aleman, 2000:47; Perez-Aleman, 2003:796; FAS, 2005; Cypher, 2004).

The question remains to what extend ProChile has contributed to the development of the salmon sector. Studies of Maggi Campos and Montero *et al.* claim that the relationship between the salmon sector and ProChile is not very intensive. In other countries, ProChile claims the salmon sector to be one of their successes, but at the same time, salmon producers claim that their promotion campaigns are too broad and not specific enough. The reason for this is that ProChile promotes the Chilean agricultural sector as a whole. Instead, salmon producers would prefer a more tailor-made and sector specific approach (Maggi Campos, 2004:12; Montero *et al.,* 2000:25). One of the explanations of this perception of salmon producers might be that their producers association SalmonChile already has an intensive marketing programme, through which ProChile's role for the salmon sector is not too important. In the past however, and especially until 1986 when SalmonChile was not established yet, ProChile's efforts to promote the salmon sector were very important to open up the first export markets.

8.3 The provision of subsidies – CORFO

The public organisation of CORFO (Corporación de Fomento or Economic Development Agency) was established in 1939 and as a department of the Ministry of Economy, Promotion and Reconstruction. From the beginning onwards, CORFO had the same goal, namely the promotion of industrial development. The manner in which this goal was achieved changed considerably over the time. Between 1939 and 1973, its main goal was to carry out the import substitution industrialisation strategy of the Chilean government, so a national production basis could be build up[29]. CORFO did this, among others, by creating new public and public-private firms. Between 1940 and 1973 for example, CORFO established 13 of the country's 20 most important exporting companies. In 1970, it was directly involved in about 50 firms, and in 1973, this had increased to 180 (Alarcón & Stumpo, 2001:172; Moran, 1989:496). In 1964, IFOP (Instituto de Fomento Pesquero) or Fisheries Development Institute was created as a department of CORFO. At this time, IFOP acted as the central public organisation in experimenting with possibilities of introducing salmon farming in Chile. The efforts of IFOP at that time were mainly concentrated on pisciculture and the production of eggs (Iizuka, 2004:9; Montero *et al.,* 2000:25).

After the military coup of 1973 however, a neoliberal model was introduced, and the import substitution programmes were rapidly eliminated. The role of CORFO changed radically. Until the crisis of 1982, it was put in charge of the programme to sell off all the state-owned firms that it had created before. At the same time, the programme for the creation of new enterprises was terminated (Alarcón & Stumpo, 2001:172; Moran, 1989:496).

Nevertheless, this did not imply that CORFO was not involved in assisting new sectors. From 1973, a new role was assigned to CORFO by the military regime. This new role concentrated on the managing of funds for the promotion of scientific and technological development in relation to new natural resource based export sectors (UNCTAD, 2006:8). Considering the salmon sector for instance, CORFO awarded a financial loan in 1974 to the first private initiative to farm rainbow trout for commercial purposes (Iizuka, 2004:10; Lahera & Cabezas, 2000:1098). The role of CORFO between 1973 and 1982 considering the provision of loans was important but not very dominant.

After the crisis of 1982, the military regime realised that their radical programme of neoliberalism had failed in a number of ways. The regime recognised that undeveloped and weak sectors – such as the salmon sector – would not flourish under the neoliberal

[29] See chapter seven, section 7.2, for more information on import substitution industrialisation.

programme, simply because they were not efficient and competitive. The credit programmes of CORFO were intensified, and cooperation was initiated with the Inter-American Development Bank (IDB). Together they provided more US$ 1 million in cheap credits to investors related to new non-traditional export sectors in 1983. In 1986, both organisations made another US$ 1.2 million of loans available for the same sectors (Schurman, 1996a:96 in Kurtz, 2001:14).

After the transition from the military regime of Pinochet to the democratic government of the *Concertación* in 1990, CORFO was strengthened with two new funds. The first one is FONTEC[30] (Fondo Nacional de Desarrollo Tecnologico y Productivo) or National Fund for Technological and Productive Development, established in 1991. This fund supports the technological innovation of companies that are already developing new technologies in order to produce new goods and services. Between 1991 and 2002, FONTEC implemented 41 projects of approximately US$ 2.2 million. These projects were foremost related to the wine, timber and salmon sectors. Another fund, FDI (Fondo de Desarrollo e Innovacion) or Development and Innovation Fund was created in 1995. Between 1995 and 2002, it implemented 55 projects of approximately US$ 15.4 million, again mostly associated with the wine, timber and salmon sectors (Iizuka, 2004:14; TF, 2007). CORFO also has a separate programme for promotion, called PROFO (Proyectos de Fomento or Development Projects). This programme assists small producers to jointly access new technologies and reorganise their enterprises, so they can reach sufficient scale to finance the sunk costs that are involved in exporting (Agosin & Bravo-Ortega, 2006:48; Perez-Aleman, 1997 in Lahera & Cabezas, 2000:1098). Crucially, CORFO also helped the producers association SalmonChile to create a new department. This department is INTESAL (Instituto Tecnológico del Salmón) or the Salmon Technology Institute, and was created in 1995[31]. CORFO assisted again through financial support, accounting for 45% of the costs (Barton, 1997 in Perez-Aleman, 2005:668).

In short, CORFO was highly important for the development of the salmon sector through the provision of credits for starting entrepreneurs. As Schurman states, over half of the new salmon producers that she interviewed, had received at least one loan from CORFO (Schurman, 1996a:96).

8.4 Transference of technology – Fundación Chile

The public-private organisation of Fundación Chile has played a crucial role in the development of the salmon sector, as we will explain below. It was created in 1976 during the military regime, with the aim of introducing innovative technology for export oriented and natural resource based sectors in Chile. The creation of this organisation was the result of an agreement of cooperation between the Pinochet government and the ITT (International Telephone & Telegraph) corporation of the United States. Fundación Chile carries out projects that relate to the transference of already invented foreign technology; at the same time, the organisation manages this process of transference (Våge, 2005:95).

Just as the organisations of CORFO and ProChile, the role of Fundación Chile was not very prominent between 1976 and 1981. Fundación Chile did have innovative projects in this period, but these projects did not have a clear focus on specific sectors. Moreover, business people were not very eager to join and invest in these projects, due to the high financial risks involved. Especially in the new export sectors, these business people faced high costs, due to the fact that these sectors were not developed and therefore they were inefficient and not internationally competitive. During the economical crisis of 1982, investments by the private sector dropped down even more. Crucially, Fundación Chile recognised this problem and started to change their strategy. It initiated the utilisation of its own resources, focussing on those projects that were the most promising for successful

[30] FONTEC was renamed in INNOVA in 2005.
[31] See below for a description of INTESAL.

implementation. Due to the lack of involvement by business people, the organisation decided to start up its own companies in four sectors; the oyster sector, the beef sector, the blueberry sector and the salmon sector. Within these companies, technology was tried out that the Fundación introduced from other countries. In these experimental processes, interested business people were invited in order to learn from practical experiences (Ffrench-Davis, 2002:138; Fundación Chile, 2007:11-21).

Through this new strategy, Fundación Chile gradually constructed a unique model for the transference of technology. This model consists of three phases; identification of opportunities, obtaining and transferring of technologies, and scaling up and dissemination. The first phase starts with exploring the needs of the national Chilean market. These needs are often related to new export sectors that relate to the utilisation of natural resources. To carry out the identification phase, Fundación Chile has a team of professionals that visit other experienced countries. In these countries, the professionals go on excursions to specialised companies that are already producing on a large and commercial scale. Once the relevant technologies are identified, the experts return to Chile, in order to continue with the second phase. This next phase consists of three procedures; the external transfer and adaptation of the specific technology, the internal transfer with support of national and foreign experts, and the management of the implementation of technology, using the organisation's network of technology centres, universities, and companies. If the sector for which the technology is being developed is still inefficient and uncompetitive, Fundación Chile will establish a new company that experiments with the technology for commercial purposes. Finally, in the third phase, if the transfer of technology appears to be successful and when there are concrete possibilities to further expand a sector with the help of the technology, Fundación Chile will manage the process of scaling up and dissemination. As soon as the newly created 'demonstration company' makes profits in a structural manner, it will be sold to the private sector. This selling of companies generates new income for the organisation, which is invested again in new projects. An overview of the three phases is given in figure 8.1. This innovative model has a number of important advantages. First, the model reduces the financial risks for interested business people that want to participate, creating the possibility to observe a company in operation before investing. Second, the model assists in the motivation of companies in specific sectors to expand their activities. Third, it speeds up the innovation and dissemination time compared to the time that the private sector would need. Lastly, the model reduces transaction costs for companies, because when the technology is being sold, the costs for R&D are not included (Våge, 2005:95; Fundación Chile, 2007:13-22).

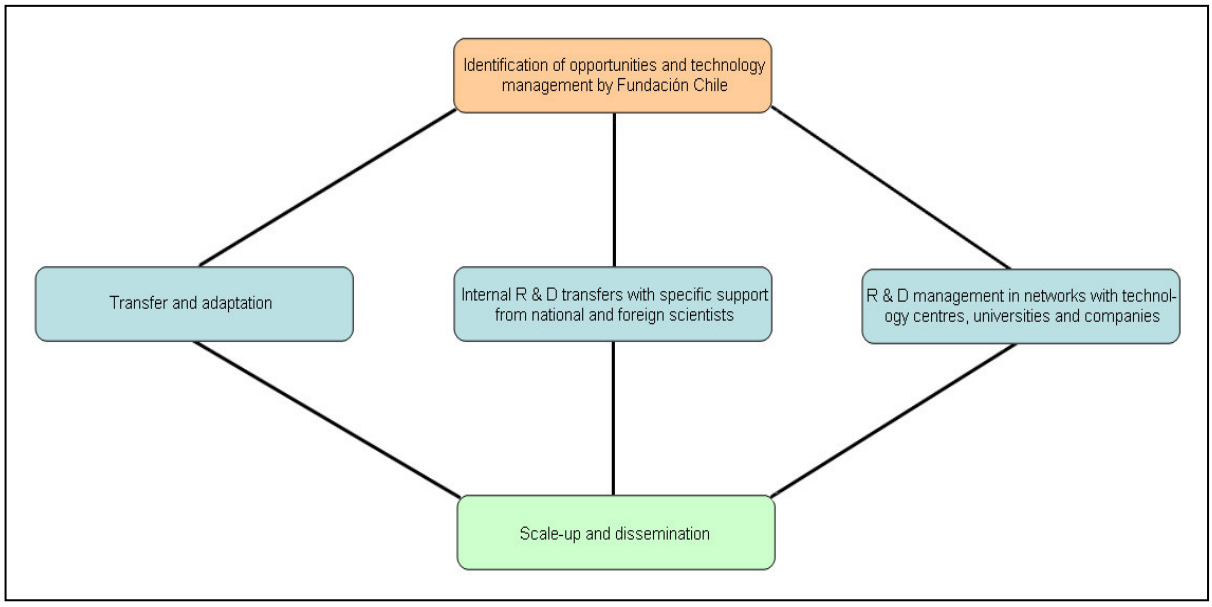


Figure 8.1: Model of Fundación Chile for technology transference (source: Fundación Chile, 2007:14)

Although quite a number of Fundación Chile's projects failed, its working model is highly successful. In 30 years time, the organisation created more than 70 companies or associations in the sectors of forestry, blueberry, biotechnology, ICT, and aquaculture, exporting their products and services to tens of different countries worldwide. Moreover, there has also been international attention to Fundación's model, for instance from the World Bank, the Inter-American Development Bank, R&D institutes of developing countries, governments of Latin American countries, and media attention of Business Week and The Economist (Agosin & Bravo-Ortega, 2006:47; Fundación Chile, 2007:5-7).

The budget to carry out projects has increased significantly since its establishment. Moreover, the division of public and private finance has also changed (see table 8.2 below for an overview). In 1976, the organisation started with a budget of US$ 2.5 million, 50% being paid by the Chilean government and the other 50% by ITT. In 2005, the organisation had a budget of US$ 31.5 million, of which 88% was self-financed; the other 12% was financed by public and private organisations (Fundación Chile, 2007:21). The fact that Fundación Chile is increasingly self-sufficient in its financing can be explained by the selling of tens of profitable companies. Remarkably, the change in the structure of financing shows characteristics of Fundación Chile's own model, implying a clear shift from the public to the private domain throughout the last 30 years.

Table 8.2: Overview of the budget of Fundación Chile, 1976-2005 (source: Fundación Chile, 2007:21)

Year	Budget in US$ millions of 2005	Self-financing
1976	2.5	0%
1983	5.6	32%
1991	11.4	53%
1997	11.7	77%
2005	31.5	88%

The question arises how Fundación Chile has contributed to the development of the salmon sector in Chile. This started in 1981, when the organisation decided to buy the company Domsea Pesquera Chile, renaming it in Salmones Antarctica. Between 1981 and 1985, Fundación Chile primarily tried out new technologies from Norwegian salmon farms, such as cultivation in cages. The aim of Fundación Chile was to transfer the most suitable technology in order to be able to cultivate salmon on a large and commercial scale. From the beginning onwards, representatives in Norway, Japan, Scotland and the United States continuously provided information on how to improve the farming technologies. In 1986, this resulted in the first commercial production, and it became profitable in 1988. In that year, the goal of Fundación Chile was achieved, and as a consequence, it sold Salmones Antarctica to a Japanese fish and shellfish company wit a high profit. In the period between 1981 and 1988, Fundación Chile inspired many interested business people to start salmon cultivation. It showed these people that commercial salmon cultivation was technically possible, and had the potential of being highly profitable. After igniting the salmon sector in Chile, Fundación Chile continued to provide assistance to the salmon sector. Already in 1986, the organisation came up with the idea of creating a producers association – SalmonChile – motivating and pushing national salmon producers to cooperate. As we will see below, this private organisation would gradually take over the coordinating role of Fundación Chile. By the 1990s, Fundación Chile had created a network of services, relating to domestic production of eggs, fish feeding, farm sites, processing plants, and economic feasibility studies. Nowadays the organisation still assists the salmon sector in doing R&D on fish feeding, focussing on pigmentation and the replacement of fish meal and oil with plant-based products (Agosin & Bravo-Ortega, 2006:46; Ffrench-Davis, 2002:138; Iizuka, 2004:12-16; Fundación Chile,

2007:30-36). Thus, exactly according their model, Fundación Chile had a strong coordinating role in the 1980s, which gradually changed into a facilitating role in the 1990s.

Fundación Chile played a crucial role, for the economic growth in Chile in general, more specifically for new export sectors and last but not least, its contributions were fundamental for the development of the salmon sector. Although Fundación Chile was not pioneering in trying out salmon cultivation in Chile, it definitely ignited the development of the salmon sector, by transferring and adapting the most suitable technology for commercial and large-scale cultivation. Their 'demonstration company' convinced many business people that salmon cultivation had the potential of becoming a highly profitable activity. Moreover, the organisation took over the investor's risk of transferring and trying technological innovations. It realised that private investors are not likely to invest due to high financial risks, which is a direct consequence of undeveloped sectors that are not efficient and competitive yet. Indeed, Fundación Chile was the 'hub organisation', the central key player in the development of the salmon sector, strongly coordinating the building up of the sector in the beginning, and later on in stepped back but still played an important facilitating role. Fundación Chile is not a technology innovator itself; however its working model is a true and highly successful innovation.

8.5 Marketing and quality control – SalmonChile

The private organisation of SalmonChile was created in 1986 by 17 national salmon producers. Since its existence, it has been the most important producers association for the salmon sector in Chile. The idea to create an association for the whole sector came from Fundación Chile. At that time, SalmonChile had two main goals; collective marketing and the creation of quality standards, under the mission of 'producing a high value product in sustainable and socially responsible way'. Clearly, Fundación Chile, SalmonChile and the participating producers, realised that international marketing by individual companies was too costly. Moreover, these parties also acknowledged that a quality certification system was crucial for the sector, in order to produce salmon on a stable level of quality, that was high enough to meet international standards. This is highly important, because without such standards, the important export markets of the United States, the European Union and Japan will not allow any food related imports. Again, the parties recognised the need to cooperate in order to achieve this common goal. Naturally, these two goals are connected to the broader goal of expanding the industry and to become more competitive internationally (SalmonChile, 2007b; Alvial, 2007:4; Iizuka, 2004:12).

Especially in the 1990s, the efforts of SalmonChile to promote the sector collectively on international markets started to show results. This success can be related to the professional manner in which SalmonChile operated; however, the free trade agreements that were signed by the democratic *Concertación* governments of Chile also contributed to create new possibilities for opening up export markets. This resulted in important new export markets, next to the 'traditional markets' of the United States, the European Union and Japan. Examples of these new export markets are Argentina (1991), Mexico (1992), Venezuela (1995), Colombia (1996), Taiwan (1994), Thailand (1994), Singapore (1995) and China (1997). Through these new markets, the booming salmon production found new destinations, that were desperately needed, especially in relation to overproduction and dumping accusations (Iizuka, 2004:13; Maggi, 2002 and SalmonChile, 2003 in Iizuka, 2004:13).

Considering the second aim, quality control, SalmonChile also played a crucial role. The organisation coordinated the implementation of quality standards in a self-regulated process, resulting in the 'Code of Standards for Chilean Salmon' in the mid 1990s. The Code introduced a new method of evaluating each separate stage of the production process. Later on, these standards were adapted by the public organisation of SERNAPESCA, charged with

the control and inspection regulated in the legal framework for aquaculture (Achurra, 1995 in Perez-Aleman, 2005:667; Montero *et al.*, 2000 in Perez-Aleman, 2005:668).

During the 1990s, the role of SalmonChile gradually became more important, implying an extension of their targets. Besides marketing and quality control, the organisation also started to focus on the representation and lobbying of the collective of salmon producers in order to enable the sector to speak with one strong voice. This makes SalmonChile an organisation that has the capacity to seriously influence governmental organisations considering the creation and implementation of aquaculture related policies. Furthermore, SalmonChile started to focus on extending and intensifying the network of the salmon cluster, by supporting links and exchange with related or similar institutes and with scientific or educational institutes in Chile and abroad. In this perspective, SalmonChile regularly organises conferences, seminars, congresses, expos, and campaigns. Another example of the extension of services is the offering of excursions and training for the employers of salmon companies (SalmonChile, 2007).

The extension of services also resulted in a new department, called INTESAL (Instituto Tecnológico del Salmón) or the Salmon Technology Institute. This department was created in 1995, with support of CORFO, accounting for 45% of the costs. INTESAL specifically deals with the new targets of SalmonChile. Moreover, INTESAL was also created to commonly deal with the technical problems of salmon cultivation, such as diseases. It focuses on research, personnel training and promotion of new technologies in order to increase efficiency and reduce health and environmental risks for the associated salmon producers. A concrete example that demonstrates the work of INTESAL, is the signing of an agreement in 2001 between salmon producers – represented by SalmonChile – and the government, to start up the clean production programme. The agreement involves companies on a voluntary basis in order to apply methods and techniques of production that are more environmentally sustainable. In practice, this implies more recycling of waste products and an more optimised use of materials. Furthermore, management strategies and modern environmental technologies are adopted in order to achieve high quality standards and a more sustainable development of the salmon sector. With the establishment of INTESAL the involved organisations – CORFO, SalmonChile, INTESAL and the salmon producers – acknowledged that a number of targets were out of reach for individual companies or organisations; therefore they once again decided to join their efforts and to commonly work on these new complex and long-term goals. This cooperation provided new opportunities to expand the sector and achieve economies of scale (Barton, 1997 in Perez-Aleman, 2005:668; Niklitschek *et al.,* 2005:6; Iizuka, 2003:15; Iizuka, 2004:13-17; Alvial, 2007:3). In other words, INTESAL efficiently functions as a mediator between salmon producers that face technical problems on the one hand, and research institutes that execute tailor-made research & development on the other hand.

In 2002, SalmonChile was increasingly promoting the salmon sector as a cluster, both nationally as internationally. Therefore, it decided to open up its doors for other companies related to salmon production, such as packing producers, material producers, feeding producers, transport companies and other service related companies. Nowadays the organisation has 76 associate companies, including 25 salmon producers – accounting for more than 90% of the total salmon production – and 51 material and service providing companies (Iizuka, 2004:16; SalmonChile, 2007).

Thus, the contribution of SalmonChile to the development of the salmon sector was highly important. Over the last 25 years, we have seen a shift from public organisations that are firstly coordinating the development of the salmon sector, and then step back to facilitate the development of the sector. At the same time, private organisations have taken over the coordinating role of the public organisations. By far the most important coordinating organisation is SalmonChile, which has taken over the role of central player or 'hub organisation' from Fundación Chile.

SalmonChile has shown to be an indispensable and guiding organisation that coordinates the salmon cluster. The organisation proved its strength and skills during the

crisis of 1998, caused by overproduction and dumping accusations. SalmonChile effectively dealt with these challenges by coordinating cooperation in the cluster, and introducing the appropriate measures. Since its existence, SalmonChile has changed the mentality of participants in the salmon cluster, by making them aware of the fact that the only way to compete on an international level, is to effectively cooperate on a national level.

8.6 Review of the chapter

Explaining the fast and sustained development of the Chilean salmon sector from the perspective of organisations, cannot be done by pointing at a single organisation only. Thus, considering the theme of organisations, we have to look at the aggregate value, characterised by strategic interorganisational cooperation.

As we have seen, Fundación Chile was crucial for the development of the sector, but without the loans of CORFO the sector might not have developed either. This is also the case with ProChile, that has done important promoting and marketing for the sector before SalmonChile was established. SalmonChile's contribution is and was also highly significant, due to its efforts on marketing and quality control, but foremost because it took over the leading role as a coordinator of the salmon cluster, at the moment that public organisations such as Fundación Chile and CORFO stepped back.

Note that there is a crucial and common characteristic among the organisations of Fundación Chile, CORFO and ProChile. This common characteristic relates to the fact that the economic crisis of 1982 caused a crucial turning point in their strategy to assist in the creation of new export sectors. Before 1982, the three organisations were foremost operating on the background. After 1982 however, the need was recognised that the active involvement of these public and public-private organisations was essential in the strategic interorganisational cooperation. These new partnerships between public and private organisations would prove to be an essential strategy in order to create economic growth through the creation and expansion of new export sectors.

In the 1980s, Fundación Chile has been the central player, the 'hub organisation'. Being a public-private organisation, Fundación Chile acted as a mediator between public and private organisations, strongly encouraging the cooperation between them. Through its 'demonstration company', it reduced the investors risks to start new salmon companies, and through transference and adaptation of technology, it showed that salmon cultivation was technically possible and had the potential of becoming very profitable. In other words, Fundación Chile made businesspeople aware of the opportunities and huge potential that the new salmon sector had. Thus, Fundación Chile played a fundamental, catalytic and coordinating role in the development of the sector during the 1980s. In the 1990s, when the goal of Fundación Chile was achieved – namely igniting the development of the salmon sector – the organisation gradually stepped back. At the same time, the private organisation of SalmonChile took over the role of Fundación Chile, and became the new 'hub organisation'. This organisation was decisive in its marketing strategies, opening up new markets and coordinating the expansion of the salmon cluster. It also developed quality standards, in order to be able to produce salmon on a quality level that was high enough to enter new export markets. Moreover, SalmonChile has been a leading coordinator that has made all participants of the salmon cluster aware that the only way to compete on a large international scale is to cooperate on a national level.

Thus, within the strategic interorganisational cooperation of the Chilean development model, we can notice a strong influence of public organisations in the 1970s and 1980s; this strong influence shifted to private organisations in the 1990s. We can clearly see how public organisations strongly coordinated the building up of new export sectors, together with private organisations. When these sectors became efficient enough to compete on an

international level, the public organisations stepped back, and the private organisations took over the coordinating role.

The strategic interorganisational cooperation between public, public-private and private organisations that has arisen since the 1982 crisis, has made the traditional division between the public and the private domain less clear. The two domains are evolving towards each other, and in some ways they are even merging.

This chapter has explained that a highly important contribution to the fast and sustained development of the Chilean salmon sector is strategic interorganisational cooperation, characterised by a flexible and dynamic interaction between public, public-private, and private organisations. Throughout the last 30 years, they have continuously complemented each other in relation to adaptation of technology, hygienic and sanitary standards, and establishing and modifying aquaculture regulations.

Chapter nine

Property rights in practice – The concessions system

9.1 Introduction

In this chapter we are going to describe the regulatory framework of the concession system. The aim is to explain how the concession system influenced the development of the salmon sector in the last 25 years. Note that this chapter relates to the theory on property rights of chapter 3, section 3.4. Concessions are a form of user rights, and user rights are a form of property rights. Thus, a concession grants an individual the use of a specific location of the marine territory. Six characteristics of property rights can be distinguished. Security is about the extent in which the rights of a property right are protected by the legal system of a country. Transferability of a property right refers to the manner in which it is possible for a property right holder to transfer it to another individual or group. Duration of the property right refers to the amount of time that the property right is valid. The exclusivity of a property right defines the possibilities for the holder to use and manage the property. Flexibility relates to the manner in which it is possible for the holder and granter to make exceptions in relation to the official conditions of the rights and obligations of a property right. The divisibility of a property right is the legal possibility for the holder to change the granted scale of the property that is used.

It is important to explain the difference between marine concessions, aquaculture concessions and aquaculture authorisations. A marine concession grants the use of a specific location of the marine territory for a certain type of infrastructure or for a certain construction. The marine concession can apply to all sectors, such as tourism, fisheries, aquaculture and other industries. With this form of concession, the holder can develop constructions such as wharfs or docks and the necessary infrastructure. An aquaculture concession grants the use of a specific location of the marine territory for the specific purpose of aquaculture. Lastly, there are aquaculture authorisations, for the purpose of breeding and cultivating young salmon in fresh water (in tanks on land), before they are transported to the ocean for the grow-out phase. In other words, an aquaculture authorisation grants the use of fresh water from lakes or rivers for the specific purpose aquaculture (SUBPESCA, 2003:57). From now onwards, we will use the word ‘concession’ to refer to the ‘aquaculture concession’.

The chapter is organised as follows. The first section focuses on the general development of the legal framework for aquaculture. The next section zooms in on the General Law on Fisheries and Aquaculture (LGPA). After that, we will concentrate on two aspects of LGPA that are the most relevant to explain the sustained growth of the salmon sector. First, we will look at the zonification programme. The interviews with respondents serve as a source of data to analyse the problems and advantages of the zonification programme. Second, we will consider the procedures for granting, transference and lease of concessions. Again, the data from respondents is used to analyse the problems and advantages of the system. The chapter ends with a review of the sections.

9.2 Development of the regulatory framework

In this section we will shortly describe the most relevant developments in relation to the concession system. We can divide this development in two phases, from 1960-1990 and 1990-2007.

The first phase from 1960 to 1990 was characterised by the introduction of the ‘marine concession’ in 1960, under Decree No. 340, introduced by the Ministry of National

Defence. The Decree stated that "the Ministry of National Defence, Sub-secretariat of Marine Affairs, has the control, inspection and supervision of the territorial coast and the ocean of the State, and of the rivers and lakes that are navigable for ships of more than 100 tons". This gave the Sub-secretariat of Marine Affairs the exclusive authority to grant a particular use of the national territory (TechnoPress, 2003:93; Valenzuela Alfaro, 2007:2).

In the 1970s, two public organisations were established under the military regime. In 1976, the Sub-secretariat of Fishery (SUBPESCA) was created, as a department of the Ministry of Economy, Promotion and Reconstruction. This organisation was entrusted with the creation of policies and regulations towards fisheries and aquaculture. The National Fishery Service (SERNAPESCA) was established in 1978, being responsible for the implementation of the policies and regulations created by SUBPESCA; moreover, SERNAPESCA served as an organisation for inspecting and controlling the activities of the fisheries and aquaculture sectors (TechnoPress, 2003:92).

In 1980, Supreme Decree No. 175 was created. For the first time, aquaculture and fisheries were recognised as two separate sectors. The Decree defined the activity of aquaculture, and established new procedures for the granting of concessions. From now onwards, the granting of concessions took place through the cooperation between the Sub-secretariat of Marine Affairs, the Sub-secretariat of Fishery, and the National Fisheries Service. Still, concessions were non transferable and not subject to juridical issues (Pérez Yáñez, 2002:14-15).

In the second phase from 1990 to 2007, a new legal framework for fisheries and aquaculture was put into place, called the 'General Law on Fisheries and Aquaculture' (LGPA). This overarching law, established under Decree No. 18.892, was implemented in 1991 and introduced a number of crucial changes. Since 1991, there are two types of concessions; a marine concession and an aquaculture concession. With a marine concession, the Sub-secretariat of Marine Affairs grants permission for the use of a specific part of the marine area for a certain type of infrastructure or for a certain construction. This can be related to tourism, in the form of a hotel in a coastal area; but it can also be a wharf, or a dock. With an aquaculture concession, the Sub-secretariat of Marine Affairs grants permission for the use of a specific part of the marine area for the specific purpose of aquaculture. LGPA also distinguished freshwater pisciculture as a separate activity of salmon cultivation[32]. Therefore, a separate permission was introduced for the use of freshwater in lakes and rivers, called an 'authorisation' (SUBPESCA, 2003:57). Another important part of LGPA was a zonification programme. Under this programme, so-called 'Appropriate Areas for the exercise of Aquaculture' (AAA) were established. This made clear on which locations of the marine area aquaculture could take place, and which areas not. Lastly, LGPA changed the legal status of aquaculture concessions, making them transferable and subject to juridical issues (SUBPESCA, 1991).

In 1994, the National Commission for the Environment (CONAMA) was established through the General Law on the Environment (LBMA). From 1997 onwards, all applications for new concessions were subject to the Environmental Impact Evaluation System (SEIA) (FAO, 2006; OECD & UNECLAC, 2005:3; Cicin-Sain *et al.*, 2001:120).

In 2003, SUBPESCA introduced the National Aquaculture Policy (PNA). The objective of PNA is to achieve a maximum economic growth of aquaculture in Chile, in an environmentally sustainable manner, and with equity in access. To execute this objective, a National Aquaculture Commission was created (SUBPESCA, 2003). Through PNA, entrepreneurship is encouraged, export efforts are supported and fish farmers are assisted to manoeuvre through the bureaucracy of the legal framework (Neill, 2003:vi). Moreover, the Commission functions as a supervisor to signal problems in the regulatory framework. For example, the Commission has analysed the problem of the delay in the granting of concessions, and advised SUBPESCA on regulatory changes to deal with this problem.

[32] Consult chapter 5, section 5.3, for an explanation of pisciculture.

9.3 The General Law on Fisheries and Aquaculture

The General Law on Fisheries and Aquaculture is a rather complex set of laws and regulations. This has resulted in the fact that aquaculture is one of the most regulated activities in Chile (SUBPESCA, 2003:59). As we have seen in the previous section, the framework evolved throughout a time span of more than 40 years. This implies that LGPA was not maintained as a static framework; it was continuously modified and changed, depending on new developments within the aquaculture sector in general, and the salmon sector in specific. Modifications of LGPA are often the result of the cooperation between the public and private sector. When the private sector signals problems with certain laws or regulations, it often reports these issues to organisations of the public sector – such as the National Aquaculture Commission – in order to commonly find a solution. The producers association SalmonChile plays an important and influential role in this respect.

Considering aquaculture, LGPA essentially consists of three categories of regulation. The first category deals with the import of hydro-biological species, the second category deals with the applications for concessions, and the third category focuses on the operationalisation of concessions through environmental regulations. The three categories of regulation are specified by specific articles of LGPA (SUBPESCA, 2003:60). In table 9.1 below, an overview is given of the framework of LGPA.

Table 9.1: Overview of the General Law on Fisheries and Aquaculture (source: SUBPESCA, 2003:60)

Type of regulation	Specification	Article LGPA	Decree
Applicable to the import of hydro-biological species	Regulation for the procedure for the import of hydro-biological species	Article 11	D.S. (MINECON) Nº 96 from 1996
	Regulation for sanitary certificates and other requisites for the import of hydro-biological species	Article 11	D.S. (MINECON) EX. Nº 626 from 2001 (repealed 325/1999)
	Regulation for the use of species that are imported for the first time	Article 12	D.S. (MINECON) Nº 730 from 1995
Applicable to applications for concessions and authorisations	Regulation for concessions and authorisations	Article 76	D.S. (MINECON) Nº 290 from 1993 Nº 604 from 1994 Nº 257 from 2001 Nº 165 from 2002
	Regulation on AAA and the limitations of AAA	Article 67 Article 88	D.S. (MINECON) Nº 550 from 1992
	Regulation on the National Aquaculture Register	Article 69	D.S. (MINECON) Nº 499 from 1994
Applicable to the operationalisation of concessions and authorisations	Regulation for protection and control of high-risk diseases	Article 86	D.S. (MINECON) Nº 319 from 2001
	Regulation for protection and control of species that can constitute plagues	Article 86	Not promulgated
	Regulation for protection measurements for the environment for the activities of aquaculture	Article 87	D.S. (MINECON) Nº 320 from 2001
	Regulation for the procedure of delivering information on aquaculture activities	Article 63	D.S. (MINECON) Nº 464 from 1995
	Regulation for sanitary control of fish feeding and biological products used in aquaculture	Article 122	Not promulgated

The main aim of this thesis is to find out which factors were decisive for the development of the salmon sector. In this respect, two subjects of the regulatory framework are relevant to elaborate in more detail. The first subject is the zonification through the Appropriate Areas for the exercise of Aquaculture. The second subject consists of the procedures to apply for a new concession, or for a transfer or lease of a concession.

9.4 Appropriate Areas for the exercise of Aquaculture

When LGPA was implemented in 1991, the zonification under the regulation of AAA (article 67) had not been executed yet. Furthermore, it has to be mentioned that AAA only apply to the coastal zone; freshwater resources such as lakes and rivers are not part of AAA[33].

The AAA are established by means of Supreme Decree of the Ministry of National Defence, through technical studies prepared by the Sub-secretariat of Fishery and under procedures of consultation with stakeholders. The latter can relate to capture fisheries, coastal communities, tourism, and national parks, reserves, or national monuments. Thus, it is the responsibility of SUBPESCA to determine which areas can be used for exercising aquaculture. The same public organisation is also responsible for considering the suitability to cultivate a specific specie in a specific area and to consider the possibility to cultivate other species, especially in relation to hydro-biological resources, and the protection of the environment. Moreover, AAA can only be defined in the 1 mile zone. The preparation of the technical studies is executed in cooperation with the Hydrographic and Oceanographic Service of the Army (SHOA). The latter organisation is in charge of producing nautical maps under GPS standards. After the technical studies are ready, SUBPESCA has the obligation to send them to the Ministry of National Defence for consideration (DIRECTEMAR, 2006:10; Periodico de Acuicultura, 2005:10; SUBPESCA, 1991; Valenzuela Alfaro, 2007a:4).

The process to define AAA for the Regions X and XI took place between 1992 and 1995. Priority was given to these Regions, because they are the most suitable locations for salmon cultivation. In the year 2005, AAA have been defined for the Regions I to VI and VIII to XII region. Region XII was zoned to give the salmon sector more space to develop; the other Regions were zoned mainly for other forms of aquaculture, such as the cultivation of seaweed, mussels and other fish species (Periodico de Acuicultura, 2005:10; SUBPESCA, 1991).

The interviews with respondents made clear that there are a number of problematic issues related to AAA.

First, there seems to be a saturation of available locations for concessions in Region X, where 80% of the Chilean salmon is produced. In addition, a number of shallow locations that were assigned as AAA in the 1990s do not seem to be suitable for modern salmon cultivation anymore. Shallow locations are less profitable; moreover, the pollution caused by salmon farming is less likely to flush away in these areas. A government official of SUBPESCA claimed that additional locations under AAA need to be defined. This would imply that the current 1 mile zone in which AAA are currently located, needs to be extended to the 0-7 mile zone. This would provide new opportunities for salmon companies to move to the open ocean. The advantage of the open ocean is that the deep water can be utilised to cultivate more salmon per hectare. Moreover, the environmental impact of salmon cultivation might be reduced, due to the fact that the pollution can flush out in the open ocean. The disadvantage is that the contemporary cage technology is not suitable for open ocean cultivation, due to rougher circumstances. Thus, there is a need for investments in technological innovation, which does not take place yet.

[33] See the next page for a map of salmon concessions around the city of Puerto Montt in Region X.

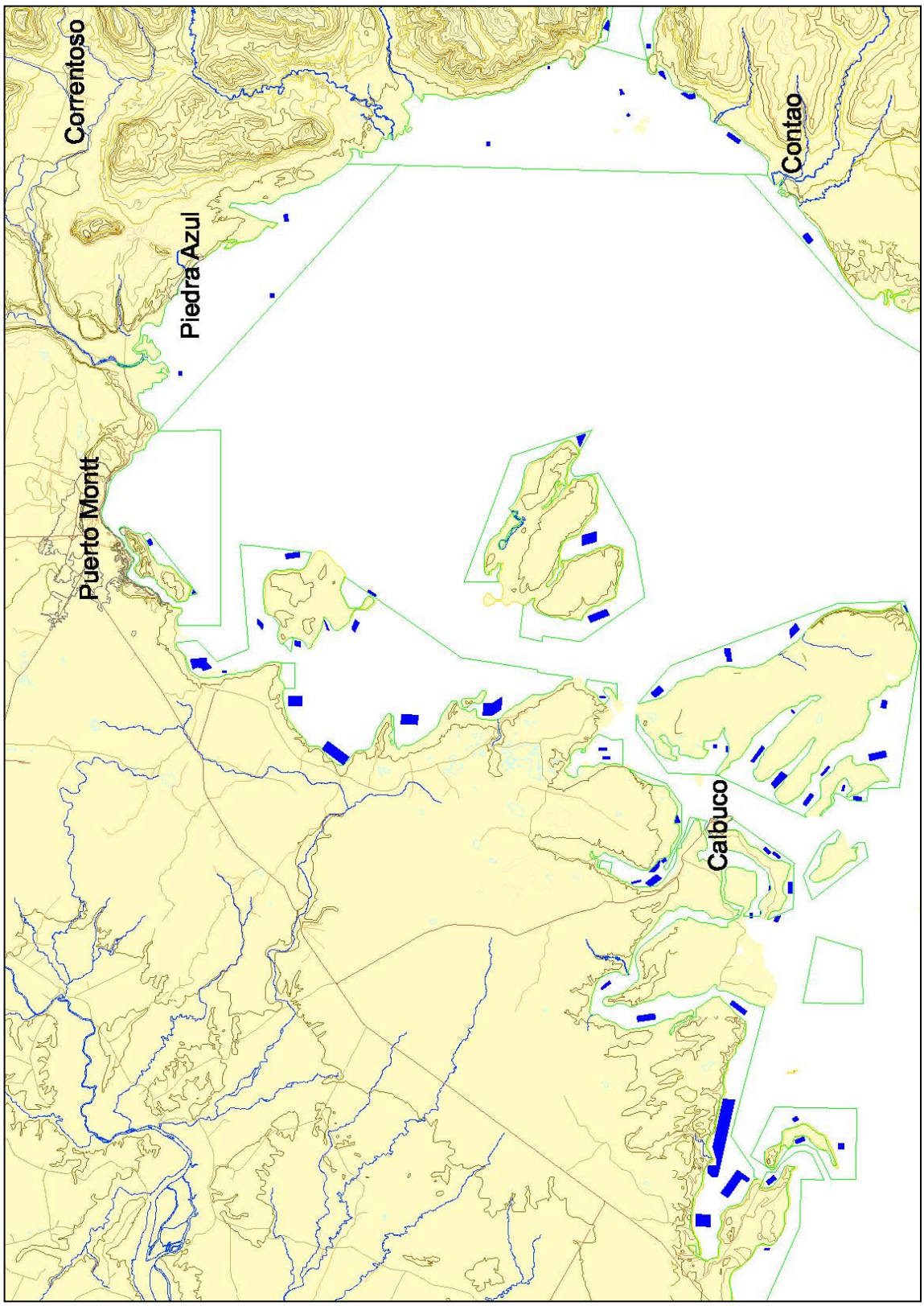


Figure 9.1: Map of the salmon concessions (blue) and AAA (green) around the city of Puerto Montt, Region X (source: CONAMA, 2007).

A second problem is the fact that legal zones are only appointed to those who exercise aquaculture; there are no legal zones for other sectors such as tourism or industrial activities such as factories that treat the wastewater of cities. The essence of the problem – according to a law expert – is the fact that zones of aquaculture have a legal status and zones for other sectors do not. In other words, those who exercise aquaculture have the legal right to develop in specified zones through the aquaculture concession; other sectors can develop projects through a marine concession, but these concessions are not based on legal zones that are specifically created for separate sectors. This difference in the legal status of coastal zones is the core of a number of conflicts, especially between aquaculture and tourism. This might imply that the potential for the further development of these sectors is not fully utilised at this moment.

Third, the huge area in which AAA are defined offers problems for inspection and control of salmon farms by the National Fishery Service. Together, the Regions X, XI and XII are more than 1,500 kilometres long, from the north to the south. In combination with a lack of human, material and technological capacities of the National Fishery Service, it is almost impossible to verify whether salmon farms are operating in line with the environmental regulations.

Lastly, there have been delays in defining AAA. This was caused by the old cartography that was made before the earthquake of 1960. Due to this earthquake many coordinates did not correspond to the correct location anymore. Moreover, these maps were created for navigation, and not for the purpose of aquaculture. The consequence was that until recently, there was a lot of uncertainty about the exact coordinates of concessions. This again caused an overlap of a number of concessions. However, due to the improved cooperation between SUBPESCA and the cartography service SHOA, and with the utilisation of modern techniques such as GPS, most of these problems have been solved.

Respondents were also asked about the advantages of zonification for the development of the salmon sector. The first advantage relates to the certainty that AAA provide. In the 1980s, the salmon sector was in a phase of exploration, but at the end of this decade this gradually changed into an exploitation phase. In other words, the sector was expanding rapidly and therefore the demand for space also increased rapidly. Thus, the sector needed certainty in relation to which locations of the coastal zone could be used for salmon cultivation, and which locations not. In the period around 1990, when the sector started to expand rapidly, the zonification programme of LGPA assured the expansion through the provision of legal geographical space. This gave the sector a legal certainty, that protected the right to access and use clearly determined parts of the marine territory.

The second advantage concerns the creation of a form of scarcity through zonification. Before the zonification programme was introduced through LGPA in 1991, the coastal zone was not divided in legal zones. As a consequence, concessions had a relatively low value. After the zonification was completed, a form of scarcity was created due to the selection of specific parts of the coastal zone. Still, the selected areas provided enough space for the sector to develop. However, the selection of areas through zonification increased the value of concessions. This resulted in a boom of applications for new concessions. As will become clear below, two problems arose from the boom in applications for concessions, namely slow procedures and speculation. However, the many new concessions that were granted – in combination with the possibility of transference and lease – also facilitated the growth of the sector during the 1990s.

The scarcity that was created through zonification did not imply that there was a lack of space for the sector to develop. On the contrary, especially in the beginning of the zonification programme there were plenty of AAA available. This is the third advantage of the early stages of zonification. As mentioned above, the sector was rapidly expanding around 1992, when the first zonification programmes started. Because of this fast expansion, the sector needed certainty in relation to where it could develop; but it also needed certainty that enough zones were available, so that long-term investments could be made to continue and reinforce the expansion in the future. In addition, the public organisations that were involved

in the zonification of the coastal zone strategically focused and the creation of enough AAA in the Regions X and XI, that were the most suitable and most potential areas for salmon cultivation.

The last advantage is that zonification was used to create economies of scale. Because public organisations decided which areas were assigned as AAA and which areas not, the government had an important instrument to plan the geographical development of the salmon sector. In other words, the zonification programme has contributed to create economies of scale, in order to eventually develop the salmon cluster.

9.5 Granting, transference and lease of concessions

We will first analyse the procedure for applying for a new concession of aquaculture. Since this procedure is rather complex, we will skip some minor steps, in order to keep the overview.

The regulation on concessions is part of Title VI of LGPA, under the articles 67 to 90. According to article 71, Chileans and foreigners that have a permanent permit of residence in Chile can apply for a concession. Furthermore, Decree No. 34.624 from 1993 that specifies the regulation on concessions gives the holder the right to use the concession for an indefinite time (DIRECTEMAR, 2006:7; SUBPESCA, 1991).

The application procedure begins with checking geographical coordinates. The applicant has to verify at the Marine Authority of the Army and the Hydrographic and Oceanographic Service of the Army, if the coordinates lie within AAA, and if the coordinates are not in use by holder of a concession that is already granted. After the geographical coordinates are checked, the applicant can hand in a technical project at the regional office of the National Fishery Service. After this public organisation has approved the project, it will hand over the report to the Sub-secretariat of Fishery. If the latter organisation approves the project, it will send a copy to the National Commission for the Environment (CONAMA). If CONAMA pre-evaluates the project positively, it will inform the applicant to start the procedure for the System of Environmental Impact Evaluation (SEIA). If the outcomes of SEIA are approved, CONAMA sends an approval certificate to SUBPESCA. This organisation will inspect the certificate, and after approval it will send copies to the Sub-secretariat of Marine Affairs, from the Ministry of National Defence. When this last public organisation also approves the technical project, the concession will be granted[34] (SUBPESCA, 2006).

After the concession has been granted, the holder has several obligations. If the holder has applied for a fully transferable concession, a fee for the granting procedure needs to be paid, of approximately US$ 2,100 per hectare, with a maximum of US$ 10,500 for the total surface. Those holders who applied for a semi-transferable concession do not have to pay for the granting procedure. The new concession has to be registered at the National Aquaculture Register of the National Fishery Service. In addition, the holder has to pay an annual fee for the concession, which is approximately US$ 100 per hectare (Terram, 2005:4; SUBPESCA, 2006).

The transferable and semi-transferable concessions were introduced to deal with the problem of speculation through a secondary market. The National Aquaculture Commission has studied on solutions to deal with this problem. This resulted in the implementation of law 20.091 in 2006, introducing two types of transferability. As we have seen above, an application fee has to be paid for fully transferable concessions; for semi-transferable concessions there is no application fee. Fully transferable concessions expire when they are in not operation within 2 years; semi-transferable concessions can only be transferred after 6 years, with a minimum of 3 years of operations.

[34] See figure 9.2 on page 83 for an overview of the application procedure for concessions.

One of the important characteristics of the application procedure is that it starts and ends with the departments of the Ministry of National Defence. This implies that the influence of these departments is significant; in addition, it can be stated that the Defence departments do have an important amount of control over the procedure. As article 80 of LGPA mentions, the Ministry of National Defence has the exclusive power to grant a particular use of the national territory. This is not surprising, since this Ministry is in charge of the control, inspection and supervision of the whole coast and the territorial waters of Chile, as defined in Decree No. 340 from 1960 (SUBPESCA, 1991 ; Valenzuela Alfaro, 2007a:3).

Considering the transference and lease of concessions, it is important to mention that such transactions were not possible before LGPA was introduced in 1991. We will now explain why transference and lease can be important to facilitate the growth of the salmon sector.

The transference of concessions makes it possible to permanently assign the rights and obligations from the original holder to a new holder. By far the most important reason to transfer a concession is when a salmon company cannot wait for the granting of a new concession. Thus, the transferability of concessions offers an attractive alternative for the rather slow granting procedures.

The transferability of concessions is also a crucial aspect of the concession system, because it facilitates a certain division of concessions. This division can be related to two aspects; the cultivator and the location of cultivation. Considering those who cultivate salmon, the transferability of concessions makes it more likely that the activity is executed by those who are the most capable of cultivating salmon. Capability relates for example to financial resources and the quality of the product. Transferability of concessions also facilitates a certain division of concessions in a geographical sense. Companies need to have a certain concentration of concessions, in order to reach a certain amount of hectares in an area. If the amount of hectares is too low, it might not be profitable to start operations. However, if a company can increase the number of hectares through one ore more transfers of concessions, the total surface of concessions can become profitable enough to start operations.

The leasing of concessions makes it possible to temporarily assign the rights and obligations from the original holder to another individual. Leasing is especially relevant in two cases. First of all, a holder of a concession might not operate the concession due to certain circumstances or strategic choices. The lease of a concession makes it possible that it is utilised by another person, so there is still productivity. Secondly, just as transference, leasing offers an alternative for the slow procedures granting procedures of new concessions. In short, leasing improves the temporal divisibility of concessions.

According to article 81 of LGPA, the Sub-secretariat of Marine Affairs is in charge of the transference and lease of concessions. Thus, applications must be sent directly to this public organisation. In the process of approving or denying a transfer or lease, the Sub-secretariat of Marine Affairs will correspond to the Sub-secretariat of Fishery. After the decision has been taken, copies of the resolution have to be sent to SUBPESCA, SERNAPESCA and the General Directorate of the Maritime Territory and Marine Trade (DIRECTEMAR, 2006:20; SUBPESCA, 1991; Valenzuela Alfaro, 2007a:4). Due to simpler procedures, the transference and lease of concessions takes place in a far shorter time span compared to the procedures for a new concession.

At present, a total surface of 11,300 hectares of salmon concessions is granted in the Regions X, XI, and XII. Region X is by far the most important salmon producing area, with where almost 70% of the concessions have been granted. In total, there are approximately 2,500 concessions, and 425 salmon farms, with an average surface of 20 hectares per farm. Most farms consist of several concessions that are located close to each other. Table 9.2 makes clear that the largest salmon company is represented by Marine Harvest, with 37 concessions and a total surface of 1,215 hectares (CPAIM, 2006:69; Terram, 2005:2).

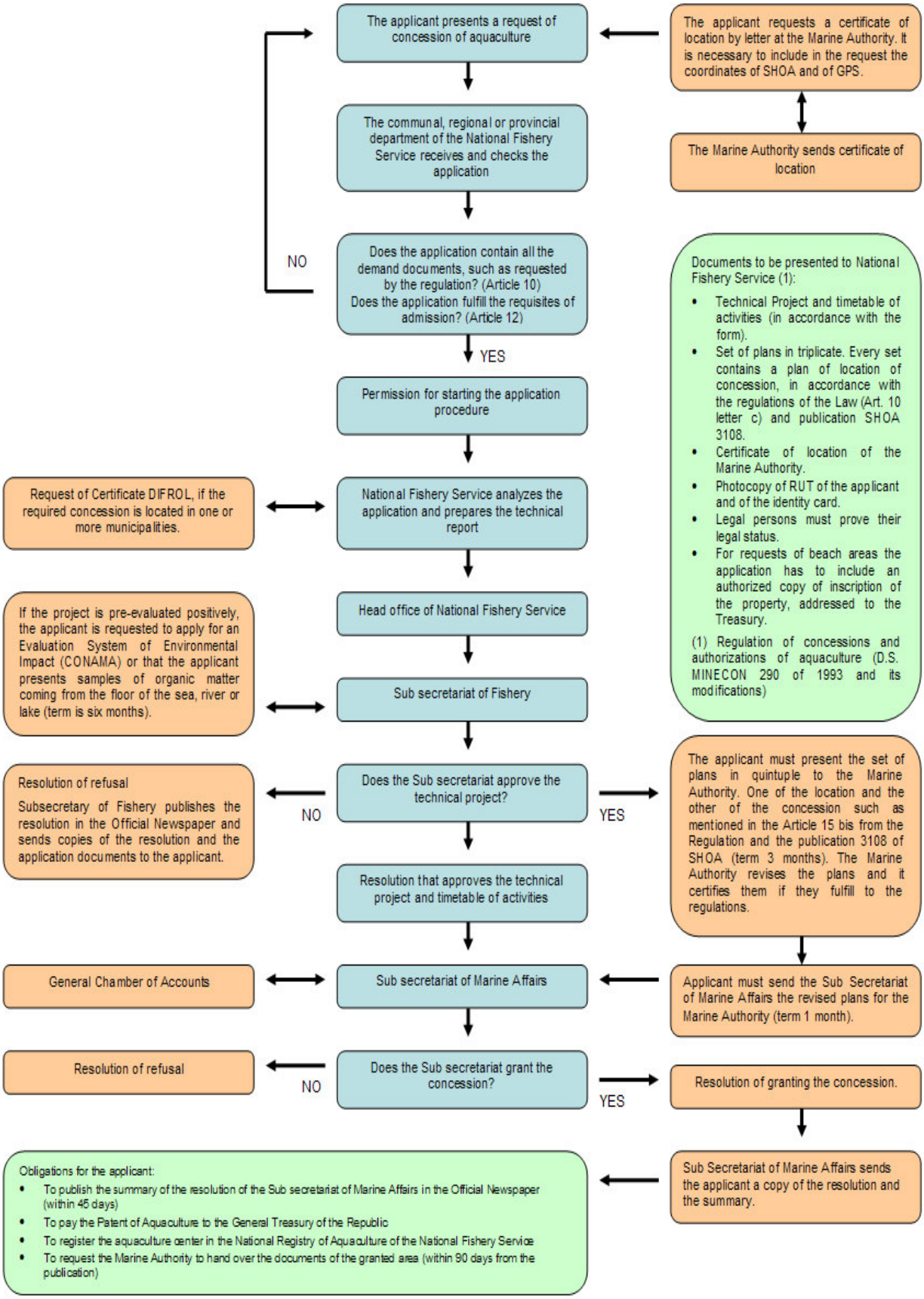


Figure 9.2: Application procedure for a concession of aquaculture (source: SUBPESCA, 2006).

Table 9.2: Overview of the 10 largest salmon companies in Chile (source: Terram, 2005:2)

Company	Number of concessions	Total surface (hectares)
Marine Harvest Chile S.A.	37	1,215
Invertec	29	662
Aguas Claras S.A.	28	576
Salmones Mainstream S.A.	25	537
Salmones Multiexport Ltda.	62	449
Pesquera Camanchaca S.A.	26	370
Salmones Pacífico Sur S.A.	38	316
Pesca Chile S.A.	60	308
Robinson Crusoe y Cía. Ltda.	12	293
Salmones Tecmar S.A.	17	268

Respondents acknowledged that there are several problems related to the procedures for the granting, transference and lease of concessions.

The first problem consists of the slow and complex procedures. Around the year 2000, it could take 7 years before a concession was granted. Consequently, companies applied for more concessions that they actually needed, to increase the chance of getting a concession. Salmon companies also anticipated on the fact that approximately 70% of the applications are refused. The problem was acknowledged, and the procedures were improved, foremost through a more efficient cooperation between the public organisations. Nowadays, the procedure takes an average of 2 years to be completed.

Another problem has been the secondary market. Because it took so much time to get a new concession, salmon companies also to tried to obtain concessions through transference. They were so eager to get these concessions that they were prepared to pay large amounts of money for a concession. Those who offered concessions for sale were often individuals from outside the salmon sector who had financial speculation as their purpose. For example, a 20 hectare salmon concession on a profitable location would cost more than US$ 1 million. As was explained on page 81, law 20.091 was introduced in 2006 to deal with this problem. At the time of writing this thesis, it was not yet clear if the new law has indeed eliminated the secondary market.

The respondents were also asked about the positive effects of the concession system. Firstly, a number of respondents noted that before LGPA was introduced in 1991, it was rather easy to get a concession. Although the procedures were bureaucratic, there was an abundance of large concessions available that gave the holder many rights and few obligations. According to the respondents, this was essential for the growth of the sector in the 1980s.

Secondly, the concession system – both before and after the introduction of LGPA – was transparent and certain. From the beginning of the commercial salmon cultivation in the 1980s, the holders had a legal guarantee that they could use the concession for an unlimited time. Most of the respondents claimed that this certainty was crucial for the investments in salmon cultivation.

Third, the introduction of the possibility of transference and lease of concessions, introduced by LGPA, made the concessions an important commercial good. In the course of time, this flexibility of the legal system caused a certain division of concessions, through which the concessions were operated by those who were the most capable of cultivating salmon. The flexibility in transference and lease of concessions made it possible to increase the salmon production quickly, and to create economies of scale.

The fourth positive effect is related to the costs that are involved for applying and operating a concession. As one respondent mentioned, there were no fees involved for starting the application procedure until 2006, in combination with a low tax for operating a concession. This implies that the overall costs that are associated with concessions are rather low. As a consequence, the barriers for starting salmon cultivation were rather low too.

9.6 Review of the chapter

In this chapter we have focused on the regulatory framework of the Chilean aquaculture. The current framework is provided by the General Law on Fisheries and Aquaculture of 1991. LGPA introduced a number of important changes. First, a specific concession of aquaculture was created. Second, a zonification programme was started to define Appropriate Areas for the exercise of Aquaculture. Third, LGPA made it possible to transfer and lease concessions; as a consequence, concessions were now subject to juridical issues. The last important change was the introduction of the Environmental Impact Evaluation System.

The framework of LGPA exists of three categories of regulation that are specified by specific articles. The first category is the import of hydro-biological species, the second concentrates on the applications for concessions, and the third deals with the operationalisation of concessions.

The first important aspect of LGPA that we elaborated in more detail was the zonification programme that started in 1992. In the first years, the important Regions X and XI were zoned; in 2005 Region XII was also zoned to provide more space for expansion of the salmon sector. Respondents pointed at four main problems in relation to zoning. First, a number of AAA locations are not suitable anymore for salmon cultivation. Second, AAA were only defined for aquaculture and not for other sectors; this causes conflicts in the use of the coastal zone by different sectors. Third, AAA have been defined in such a large area, that it is practically impossible for the National Fishery Service to inspect the environmental impact of salmon cultivation. Fourth, there was a delay in defining AAA, due the usage of old cartography. The respondents were also asked about the positive effects of zonification. First, AAA gave certainty on where the salmon sector could develop. Second, AAA created a form of scarcity of the coastal zone that increased the value of concessions; this made salmon cultivation an even more interesting sector to invest in. Third, in the early stages of zonification an abundance of AAA locations were created to give the sector plenty of space to develop. Fourth, AAA were an important instrument to create economies of scale.

The second important aspect of LGPA that we treated was the procedure for granting, transference and lease of concessions. The three main public organisations that are involved are the National Fishery Service, the Sub-secretariat of Fishery, and the Sub-secretariat of Marine Affairs. The procedure essentially starts and ends with the Ministry of National Defence. The transference and lease of concessions is done by the Sub-secretariat of Marine Affairs in cooperation with the Sub-secretariat of Fishery. Transferability is important because it can stimulate a more efficient division of concessions. Leasing is important in relation to temporal divisibility, making it possible to utilise a concession by another individual than the official holder. The procedures for transference and lease are considerably faster compared to the procedures for the granting of a new concession. The respondents signalled two important problems. First, it could take up to 7 years before a new concession was granted; this delay slowed down the development of the salmon sector. Second, a secondary market has arisen, as a direct consequence of the slow and complex procedures. Large and profitable concessions could cost as much as US$ 1 million. In 2006 a new law has been introduced to tackle these problems. The advantages of the concession system – according to the respondents – are the following. First, large concessions were relatively easy to obtain before the introduction of LGPA in 1991, and included many rights and few obligations. This facilitated the development of the salmon sector. Second, the concessions provided transparency and certainty, both before and after the introduction of LGPA. Third, the possibility of transference and lease that LGPA facilitated a division of concessions through which economies of scale could be created. Fourth, applying for a concession and operating one involved relatively low costs. This low financial barrier facilitated the involvement of many new salmon companies in the 1980s and 1990s.

It can be concluded that in spite of some serious problems, the concession system has played a crucial role in the sustained development of the salmon sector in Chile. Moreover, most of the problems arose as a consequence of the sustained growth of the sector. This implies that the involved public organisations were not prepared well enough to

deal with these problems, due to a lack of human and financial capacities. It seems that the role of these public organisations in facilitating the development of the sector – through the creation and implementation of regulations on concessions – has been underestimated. At the same time, most of the problems were recognised on time, and due to the flexible and dynamic cooperation between the public and private sector, they were solved.

During the exploration phase in the 1980s, few aquaculture regulations existed, and these regulations were rather flexible, just as the granting of new concessions. As a consequence, the regulatory barriers to access salmon cultivation were kept to a minimum. During the exploitation phase in the 1990s, LGPA was introduced and continuously improved through the cooperation between public and private parties. A strong regulatory framework evolved that provided a clear legal scope in which the salmon sector could develop.

At least two aspects of this legal scope are important for the development of the salmon sector. First, the process of zonification has introduced a form of scarcity that facilitated a form of rent-seeking. In other words, the locations that could be utilised for salmon cultivation became scarce; this scarcity increased the value of concessions. As a consequence, a form of 'concession-grabbing' was activated. Concession holders are likely to be actively involved in the further development of the sector, because the same development makes the concessions even scarcer and therefore it raises their value. In short, zonification has stimulated rent-seeking, rent-seeking stimulated new investments, and these investments stimulated the development of the salmon sector.

Second, the legal scope provided the possibility of transference and lease that was introduced by LGPA in 1991. Especially the transferability of concessions is highly important, because it forms a crucial and direct link between supply and demand. As a consequence, the concession system became relatively flexible and dynamic. Moreover, the transferability facilitated a fast circulation of concessions that caused a division of concessions that stimulated the creation of economies of scale.

Chapter ten

Review and conclusions

10.1 Introduction

In this chapter, we will combine the theory, the data of the literature, and the data of the field work, in order to construct the conclusions. First, a review is presented of the previous chapters. In the next section, the sub questions are answered. The chapter ends with the final conclusions of this thesis.

10.2 Review of the chapters

After introducing this thesis in the first chapter, we elaborated the statement of the problem in chapter two. The topic of this research concentrates on explaining the fast and sustained development of the salmon sector in Chile. This sector has become the fifth largest of the country within 25 years, generating almost US$ 2 billion per year, and providing employment for more than 50,000 people. The salmon sector is not an isolated example of successful sectors in Chile. To refer to this structural economic success, people often mention the 'Chilean Miracle'. Many scholars and politicians refer to neoliberal government policies as the most crucial factor to explain the Chilean Miracle. This assumption is critically analysed in this thesis. The three theoretical perspectives of interactive governance, interorganisational cooperation, and property rights are used to try and identify the crucial factors of success that can explain the fast and sustained development of the salmon sector.

In chapter three, the theoretical framework was presented, which is based on the perspectives of interactive governance, interorganisational cooperation, and property rights.

The interactive governance approach essentially deals with how problems can be solved and opportunities can be created through the interaction between public and private organisations. The scope in which organisations interact to achieve goals is shaped by institutions. The relation between governance and economic growth can be split up in two approaches. Market-enhanced governance theories claim that there should be little interaction between public and private sectors, because the public sector assumably distorts the functioning of the free market. Growth-enhanced governance theories claim that interaction in governance processes might be essential for economic growth, and that the public sector might assist the private sector to become efficient, competitive and profitable. The interactive governance approach is useful to understand the interaction between public and private parties in order to achieve goals. However, this approach does not explicitly focus on organisations and institutions. Therefore, the perspective of strategic interorganisational cooperation and the perspective of property rights were elaborated in order to operationalise the interactive governance approach.

Through strategic interorganisational cooperation, problems might be solved and opportunities might be created that are too complex or costly to be achieved by individual organisations. An example is a network of organisations that work together to achieve common goals. Such networks can be established to achieve long-term and complex goals with a hub organisation that stimulates, inspires and motivates the other organisations with new ideas. Another example is the alliance, such as a trade association. Organisations might participate for reasons such as sharing knowledge and collective lobbying.

The functioning of property rights is analysed through the use of six characteristics; security, transferability, duration, exclusivity, flexibility and divisibility. Use rights are a form of property rights, and they can be divided in two groups. Access rights focus on locations and

entry of the activity, withdrawal rights focus on inputs and outputs of the activity. According to the literature, property rights might be important for creating order, stability, security and certainty in economic activities and transactions.

In chapter four the methods and techniques were described for the research. A literature study in combination with a field study was used to carry out the research. The field work took place in Puerto Montt, the centre of the salmon cluster. Interviews were held with experts from salmon companies, governmental and non-governmental organisations, lawyer agencies and research institutes.

Chapter five focused on worldwide aquaculture and the salmon cultivation process. Aquaculture is not a new development but the increasing intensity and scale is a development of the last 40 years. During these years, worldwide aquaculture has grown more than 2000%. Especially the cultivation of carnivorous species can be problematic due to escapes, diseases and pollution. To produce one kilogram of salmon, almost two kilograms of wild fish is needed to make fishmeal and oil. Therefore, the future of worldwide aquaculture crucially depends on solving these problems. The production process of farmed salmon consists of the hatchery, the grow-out and the processing phase. The labour costs differ considerably between salmon producing countries. On average, wages in Chile are 10 times lower compared to Norway.

Chapter six specifically concentrated on the general development of the salmon sector in Chile. In the 1960s, many infrastructure projects were executed, such as seaports, airports, and the north-south highway. In the same decade, many engineers and experts were educated and trained both in Chile and abroad. They would prove to be very valuable in R&D on salmon cultivation in the 1970s and 1980s. In these years, new entrepreneurs were stimulated to invest in the new salmon sector. In the 1990s, the General Law on Fisheries and Aquaculture was introduced, that created a user right or concession, in order to grant individuals the right to cultivate salmon. The law also created specific zones in which the sector could develop. According to the National Aquaculture Policy, Chile plans to become the number one salmon producer in the world before 2013.

In chapter seven we analysed the developments of governance and economic growth in Chile during the last 40 years. Between 1964 and 1973, the presidents Frei and Allende acknowledged that Chile was very dependent on copper. They realised that the Chilean economy was very vulnerable to fluctuating world copper prices. Their solution was import substitution industrialisation. As a consequence, the domestic market was nationalised and put under state control. However, this policy caused a decrease in productivity and polarisation between rich and poor, and left and right. By 1973 the country was in chaos and faced a huge economical crisis, which was used by general Pinochet to take over power. Pinochet was advised on economic issues by a group of economists called the Chicago Boys. Again, the problem was recognised that Chile's economy was too vulnerable for fluctuating world copper prices. They came up with the solution to create a neoliberal economy, with a strong but small government that interfered as less as possible with the free market. The Chilean economy had to be diversified by the creation of new export sectors, utilising the country's natural resources. However, under the neoliberal programme of the government, private sectors were on their own considering investments and R&D. After the economical crisis of 1982 a pragmatic neoliberal model was adopted, which changed the roles of public and private parties. Since then, there has been an interactive governance approach, with public-private partnerships as the most important strategy for the creation of new export sectors. Since 1990 Chile has a free market democracy, in which the pragmatic neoliberal model is combined with more social equity. Between 1990 and 2006, a number of free trade agreements were signed, that opened up new markets to export the products of the growing export sectors.

Chapter eight focused on the organisations that were involved in the development of the salmon sector. In the 1980s, CORFO, ProChile and Fundación Chile fulfilled important roles in assisting the sector to develop. CORFO provided the loans, ProChile did the international promotion and Fundación Chile transferred the proper technologies. During the 1980s Fundación Chile has been the central player in the cooperation between public and private parties. This public-private organisation opened a demonstration company for salmon cultivation, making businesspeople aware of the potential of salmon cultivation and reducing the risk of starting new salmon companies. The coordinating role of Fundación Chile was taken over in the 1990 by the producers association SalmonChile. Moreover, this private organisation also took over the export promotion activities of ProChile. SalmonChile also introduced quality standards, and became a serious and influential organisation for influencing laws and regulations on aquaculture. SalmonChile is an important coordinator that has made the participants of the salmon cluster aware that the only way to compete on a large international scale is to strategically cooperate on a national level.

In chapter nine the regulatory framework was analysed. During the exploration phase in the 1980s, few aquaculture regulations existed, and these regulations were very flexible, just as the granting of new concessions. As a consequence, the regulatory barriers to access salmon cultivation were kept to a minimum. During the exploitation phase in the 1990s, the General Law on Fisheries and Aquaculture (LGPA) was introduced and continuously improved through the cooperation between public and private parties. A strong regulatory framework evolved that provided a clear legal scope in which the salmon sector could develop.

The LGPA of 1991 introduced a number of changes. Concessions were introduced that specifically granted the right to use a part of the marine territory for the purpose of aquaculture. Therefore, a zonification programme was started to define Appropriate Areas for the exercise of Aquaculture (AAA). LGPA also introduced the possibility of transference and lease of concessions.

The zonification programme is subject to a number of problems. The most important problems exist firstly of the fact that a number of granted AAA locations are not suitable anymore for salmon cultivation. The second major problem is that AAA are only defined for aquaculture; this causes conflicts with other sectors. The zonification programme also contributed to the development of the sector, due to the certainty in relation to where the sector could develop. Through zonification, a form of scarcity of the coastal zone was created, which increased the value of concessions. This stimulated investments in the salmon sector. At the same time, the sector was given plenty of space to develop, through the creation of an abundance of AAA. Lastly, AAA were an important instrument to coordinate the creation of economies of scale.

Considering the procedure for granting, transference and lease of concessions there are three main public organisations involved. These are the National Fishery Service, the Sub-secretariat of Fishery, and the Sub-secretariat of Marine Affairs. The procedure starts and ends with the Ministry of National Defence. The transference and lease of concessions is done by the Sub-secretariat of Marine Affairs in cooperation with the Sub-secretariat of Fishery. The following problems are relevant in relation to procedures. The first problem was a delay in granting, which could take more than 7 years. The second problem is the secondary market that arose as a consequence of the delays. A new law has been created and implemented in 2006, to tackle these problems. There are also several advantages of the concession system. Firstly, before LGPA, concessions were large and relatively easy to get. Secondly, the concession system provided transparency and certainty. Third, transference and lease facilitated a fast circulation of concessions, causing a division that stimulated the creation of economies of scale. Fourth, the application and operation of concessions involves relatively low costs.

10.3 Answering the research questions

By now, we can make the step towards answering the research questions. We will discuss the sub questions first and end with the main research question.

The first sub question deals with how governance affected the development of the salmon sector through time. To answer this question, we have to zoom out to the national level, and look at some important historical developments. Chapter seven made clear that between 1964 and 1973, the presidents Frei and Allende maintained an interactive governance approach based on co-governance. The crucial problem they wanted to solve was making Chile less dependent on fluctuating world copper prices. Their solution was import substitution industrialisation and nationalisation of agriculture and other industries. Therefore, many private property rights – institutions that shape the scope in which individuals and organisations engage in economic transactions – were eliminated. Thus, considering the relation between governance and economic growth, a 'radical' growth-enhancing governance model was introduced, in which the Chilean government was intensively involved in managing the economy. These policies were controversial, especially for those who owned large properties. The expropriation programmes removed the incentives for sectors to be productive and profitable, due to a lack of the right to private property. This caused a decrease in national production, and an increase of polarisation between different classes. Moreover, in the process of nationalisation, Allende worked towards a far-reaching interactive co-governance approach, in which many people were involved in decision-making processes. This combination caused total chaos in Chile by 1973.

When Pinochet took over power in 1973, he also signalled the same problem, namely the vulnerability of the Chilean economy due to fluctuating world copper prices. A neoliberal model was introduced as a solution, with a small but strong state that interfered as less as possible with the functioning of the free market. In other words, the Pinochet regime introduced a 'radical' market-enhancing governance model, implying very little interaction between public and private parties. As a consequence of the neoliberal programme, private property rights were re-introduced and reinforced with the aim of giving incentives to sectors to become more productive. The military regime also came up with the idea that new export sectors were needed to diversify the Chilean economy. But due to the radical neoliberal programme, the private sector was forced to 'self-governance'. This meant that the private sector was expected to generate new export sectors on its own, without assistance of the public sector.

After the economical crisis of 1982, the military regime realised that their non-interactive governance approach, in which the private sector 'governed' itself, did not function properly. A shift was made to an interactive governance model, in which public-private partnerships were created in order to build new export sectors. This implied that the 'radical' market-enhancing governance model was exchanged for a hybrid combination between market-enhancing and growth-enhancing governance model.

Finally, after many decades of searching for solutions for the dependency on copper, a balanced interactive governance model evolved, in which the government coordinated and later facilitated the interaction between public and private parties to develop new export sectors. The fast and sustained development of the salmon sector is one of the successful results of interactive governance, which is characterised by dynamic public-private partnerships.

The second, third and fourth sub questions concentrate on which organisations have contributed to the development of the salmon sector, how these organisations influenced this development, and how they cooperated to contribute to the development of the sector.
After the economical crisis of 1982, a number of public and public-private organisations became involved in the development of the salmon sector. In this decade, there were three important organisations that contributed to the sector. The public organisation of CORFO

provided the subsidies for starting salmon companies, the public organisation of ProChile did the export promotion activities, and the public-private organisation Fundación Chile transferred the technology for salmon cultivation. Through a 'demonstration company', the risks for investors to start new salmon companies were reduced, and through transference and adaptation of technology it was demonstrated that salmon cultivation was technically possible and had the potential of becoming very profitable. Fundación Chile made businesspeople aware of the opportunities and huge potential that the new salmon sector had. In other words, Fundación Chile acted as a central player or hub organisation that coordinated the cooperation between the organisations involved. The 1980s was foremost an exploration and learning phase, in which organisations strategically cooperated in order to learn how to cultivate salmon in a commercial manner. Financially this was made possible by CORFO; strategically it was made possible by ProChile, and technologically it was made possible by the key coordinator Fundación Chile.

The 1990s were also characterised by strategic interorganisational cooperation; however, the structure of the cooperation changed. The exploration phase had been executed successfully; now it was time to expand the salmon sector and create economies of scale. Thus, the exploitation phase had started. To do this, Fundación Chile stepped back as the hub organisation in the interorganisational cooperation. This role was gradually taken over by the producers association SalmonChile. This private organisation also took over ProChile's role of export promotion. SalmonChile became the new hub organisation that invested in marketing strategies so new markets could be opened up. It also developed quality standards, in order to be able to produce salmon on a standard quality level that was high enough to enter new export markets. For the Chilean government, SalmonChile is a serious partner that has a strong influence on improving the regulatory framework. The Association effectively coordinated the exploitation phase of the salmon sector. It showed that salmon companies are competitors and co-operators at the same time. The Association realised that companies were interdependent considering a number of resources, and that someone needed to manage this interdependency. Lastly, SalmonChile contributed to make salmon companies and other participants in the salmon sector aware that in order to compete on a large international scale, it is necessary to cooperate on a national level.

Strategic interorganisational cooperation was crucial for the development of the salmon sector. The roles of the different participating organisations changed through time. In the exploration phase during the 1980s, Fundación Chile was the central coordinator in this flexible and dynamic cooperation; in the exploitation phase of the 1990s, this role was gradually taken over by SalmonChile. Thus, an important explanation for the fast and sustained development of the salmon sector consists of the common utilisation of opportunities through strategic interorganisational cooperation, characterised by the shifting roles of coordinating organisations that flexibly adjusted to new circumstances.

The fifth and sixth sub question consists of how the system of user rights has developed through time, and how it influenced the development of the sector.

Before the introduction of the General Law on Fisheries and Aquaculture (LGPA) in 1991, concessions were regulated under a law of 1960. The law gave the Ministry of National Defence, Sub-secretariat of Marine Affairs, the exclusive authority to grant the use of a specific location of the national territory, for the purpose of economic activities. This implied that concessions were not specifically granted for aquaculture; moreover, they could not be transferred or leased. Between 1960 and 1991, the concession system was relatively flexible, because large concessions were rather easy to obtain. In addition, the military regime that ruled between 1973 and 1990 re-introduced the private property right. This assured that those who generate profits in economic activities through labour and investments have the security that this profit will stay theirs. The security of private property rights stimulated businesspeople to start new companies, among others in the salmon sector.

In 1991, LGPA was introduced. A specific territorial user right, called a concession for aquaculture, was created under this law. The most important futures of the new concession

are the unlimited duration and that it could be transferred and leased. LGPA also assigned specific zones for aquaculture; only in these zones concessions can be granted. LGPA also decides which organisations are involved in the granting procedure, and how they have to cooperate. Applications for new concessions start and end with the Sub-secretariat of Marine Affairs, and involve the National Fishery Service, the Sub-secretariat of Fishery, and the National Commission for the Environment.

During the last 15 years, the concession system has evolved in a relatively coherent, stable and flexible regulatory framework that plays a crucial role in coordinating and facilitating the fast and sustained development of the salmon sector. Once a concession is obtained, the user is granted with relatively many rights, and relatively few obligations. In addition, the concession system provides those who utilise and manage the coastal zone in relation to salmon cultivation, a relatively high degree of certainty and transparency in relation to the legally defined possibilities and constrains that shape a clear scope in which salmon cultivation can take place.

10.4 Final conclusions

In this last section we are going to answer the main research question, which focuses on the factors that can explain the fast and sustained development of the salmon sector in Chile.

The first factor is the macroeconomic policy that incrementally evolved. Throughout the last 40 years, governments have been in search for solutions to deal with the dependency of the Chilean economy on fluctuating world copper prices. Between 1964 and 1973, solutions were sought in import substitution industrialisation and nationalisation, implying a 'radical' growth-enhanced governance model. Between 1973 and 1982, the military regime introduced 'radical' neoliberalism as a solution, implying a 'radical' market-enhanced governance model. After the economic crisis of 1982, the search for a solution resulted in a hybrid combination between market-enhanced and growth-enhanced governance, or pragmatic neoliberalism. In other words, pragmatic neoliberalism evolved by trial and error as a result of the search for a solution to deal with the dependency of the Chilean economy on fluctuating world copper prices. The pragmatic neoliberal model provided the right environment in which the national economy could flourish.

The second factor is the interactive governance model that arose after the crisis of 1982, as the operationalisation of pragmatic neoliberalism. The government started to become actively involved in the coordination and facilitation of the interaction between the public and private sector. The interactive governance approach resulted in public-private partnerships that could effectively deal with the challenge of creating new sectors such as the salmon sector.

The third factor is strategic interorganisational cooperation, characterised by shifting roles of coordinating organisations, adjusted to new circumstances. Through this strategic interorganisational cooperation, the involved organisations and companies could commonly create and utilise the opportunities to develop the salmon sector. In the exploration phase of the 1980s, Fundación Chile was the central coordinator in this flexible and dynamic cooperation between organisations. Moreover, this organisation started a demonstration company in which it was shown to interested businesspeople that salmon cultivation was technically possible. Fundación Chile made these people aware of the opportunities and huge potential that the new salmon sector had. Through these activities, Fundación Chile reduced the investors' risk to engage in the salmon cultivation business. In the exploitation phase of the 1990s, Fundación Chile gradually became a facilitator; at the same time, the producers association SalmonChile took over the coordinating role within the strategic interorganisational cooperation of the new salmon cluster.

The fourth and last factor relates to the regulatory framework and the concession system. During the exploration phase in the 1980s, few aquaculture regulations existed. Before 1991 for instance, there were no environmental regulations. Although the granting of new

concessions was relatively slow, it was not very complicated to obtain them. As a consequence, the regulatory barriers to access the activity of salmon cultivation were kept to a minimum. During the exploitation phase in the 1990s, LGPA was introduced and continuously improved through cooperation between public and private parties. This legal scope gives those who utilise and manage the coastal zone a relatively high degree of security, certainty and transparency in relation to the legally defined possibilities and constrains of salmon cultivation. The strong regulatory framework that evolved provided a clear legal scope in which the salmon sector could develop.

More specifically, the zonification program of LGPA stimulated a form of rent-seeking that had a positive influence on the development of the salmon sector. The new scarcity of the coastal zone increased the value of concessions. The higher value of concessions caused a higher demand, resulting in 'concession-grabbing'. This again attracted new investments, speeding up the development of the sector. The possibility of transference is also crucial, because it forms an indispensable link between supply and demand of concessions. This again facilitated a fast circulation of concessions, which stimulated the creation of economies of scale.

This thesis demonstrates that the possibilities for sectors to achieve economic growth do not depend only on interactive governance, strategic interorganisational cooperation, or property rights. When interactive governance is well-functioning, it does not guarantee economic growth. When organisations are strategically working together on a long term, it is still not enough to achieve economic growth. And when a well-defined and well-enforced property rights system is in place, it does not imply that economic growth will flourish. Development programmes that focus only on one of these three factors separately are not likely to be very successful. The three approaches need each other because they inextricably interact and enforce each other. Thus, we might only understand the rise of sectors if we dynamically integrate the concepts of interactive governance, strategic interorganisational cooperation and property rights.

It can be concluded that the fast and sustained development of the salmon sector in Chile can be traced back to a structural problem in the national economy. Chile has faced a continuous dependency on copper throughout the last four decades. In the 1960s and the beginning of the 1970s, the presidents Frei and Allende introduced import substitution industrialisation and nationalisation as a solution for the copper dependency problem. This failed, and resulted in chaos and an economical crisis in 1973. The military regime recognised the same problem, but came up with 'radical' neoliberalism and diversification through new export sectors as the new solution. This also failed and resulted in a new economical crisis in 1982. Radical neoliberalism was replaced by pragmatic neoliberalism as the new solution. Through interactive governance, the Chilean government coordinated and later facilitated public-private partnerships to face the challenge of creating new export sectors. Through strategic interorganisational cooperation, characterised by the shifting roles of coordinating organisations, the opportunities were utilised to build up the salmon sector. The regulatory framework for aquaculture that was put in place provided a clear legal scope to further develop the salmon sector.

The result of these developments was the fast and sustained development of the salmon sector, together with the development of other natural resource based export sectors. Finally, the ultimate goal has been achieved; the dependency on copper decreased due to new export sectors, making the Chilean economy more diverse. The structural economic growth of the last two decades that resulted from this process of trial and error is what we now know as the Chilean Miracle.

Chapter eleven

A look into the future – Recommendations

In this thesis we have looked at the past to explain the fast and sustained development of the salmon sector in Chile. By looking at the past we can understand the present, but we can also apply these lessons to look into the future. Therefore, this chapter presents six recommendations that can be taken into consideration by the involved public and private organisations, in order to continue the development of the salmon sector in Chile.

1. This thesis provides arguments that the Chilean Miracle might not be the result of pure neoliberal policies. If individuals and organisations continue to perceive the Chilean Miracle as a result of pure neoliberal policies, they might act towards pure neoliberalism to continue and reinforce the Miracle. However, the argument of this thesis is that the Miracle is – among others – the result of new forms of cooperation between the public and private sector. If individuals and organisations do not recognise the essence of the Miracle, there is a risk that the Miracle will be weakened by a wrongly perceived neoliberal dogma.

2. At the time of writing this thesis, the zonification programme has only been executed for the aquaculture sector. Some other sectors do have their own coastal zones in which they can develop, but these zones lack a legal status. Moreover, there are also sectors that have no zones at all. The difference in the legal status of zones, and the lack of zoning for sectors, is the core of numerous conflicts between those sectors. Therefore, the public and private parties that are involved in the utilisation and management of the coastal zone have to put their efforts in creating a General Zoning Law that involves all relevant sectors. A clear legal scope for all involved sectors that use the coastal zone will be an incentive for these sectors to utilise the full potential of their development.

3. There are numerous salmon concessions that are located in zones that are not profitable anymore for salmon cultivation. These locations exist of shallow waters close to bays. Because the concessions are not profitable, they are not used. However, these locations might be suitable for other forms of aquaculture, such as the cultivation of seaweed and mussels. Therefore, the involved public organisations have to map the unused concessions in cooperation with the aquaculture sector, so a more efficient division of concessions can be achieved. This might have a positive influence on the development of all aquaculture sectors.

4. There is a strong need for the salmon sector to move to the open ocean. Salmon cultivation in the open ocean has the potential of being more profitable, and less harmful for the environment. For open ocean cultivation, new cage technologies need to be developed. However, this development does not take place yet. Therefore, public and private parties need to cooperate in order to jointly deal with these challenges. When open ocean cultivation is technically possible and economically feasible, an impulse is given to the further development of the salmon sector.

5. This thesis has shown that one of the explanations for the fast and sustained development of the salmon sector relates to zonification. The latter introduces a form of scarcity of the coastal zone, this increases the value of concessions, leading to rent-seeking or ‘concession-grabbing’, and this again attracts new investors. This insight makes it recommendable to define new Appropriate Areas for the exercise of Aquaculture in the 0-7 mile zone. The new zones can function as interesting alternative locations for those concessions that need to be relocated, as has been mentioned in recommendation

3. Investors will be very interested in these new concessions. Moreover, new investments will imply an impulse for the development of new technologies for open ocean cultivation, as has been mentioned in recommendation 4.

6. The procedures for the application of a new concession of aquaculture do no distinct between different types of aquaculture. As a consequence, the granting of salmon concessions slows down the granting of concessions for other forms of aquaculture, due to the enormous amount of salmon concessions applications. To speed up the granting of concessions for other forms of aquaculture, the involved public organisations should consider splitting up the granting procedures.

Glossary

Áreas Apropiadas para Acuicultura	–	Appropriate Areas for Aquaculture
Asentamiento	–	Small communal agricultural area
Comisión Nacional del Medio Ambiente	–	National Commission for the Environment
Corporación de Fomento	–	Economic Development Agency
Corporación de la Reforma Agraria	–	Corporation of Agrarian Reform
Dirección de Promoción de Exportaciones	–	Directorate of Export Promotion
Fondo de Desarrollo e Innovacion	–	Development and Innovation Fund
Fondo de Promoción de Exportaciones	–	Export Promotion Fund
Fondo Nac. de Desarrollo Tecn. y Prod.	–	National Fund for Tech. & Prod. Devel.
Instituto de Fomento Pesquero	–	Fisheries Development Institute
Instituto Tecnológico del Salmón	–	Salmon Technology Institute
Latifundia	–	Large private agricultural area
Ley de Bases del Medio Ambiente	–	General Law on the Environment
Ley General de Pesca y Acuicultura	–	General Law of Fishery and Aquaculture
Mercado Común del Sur	–	Southern Common Market
Oficina de Estudios y Políticas Agrarias	–	Office for Agrarian Research and Policy
Oficina de Planificación Nacional	–	National Planification Office
Política Nacional de Acuicultura	–	National Aquaculture Policy
Proyectos de Fomento	–	Development Projects
Secretaría Reg. de Planif. y Cooperación	–	Reg. Secr. for Planification. & Cooper.
Servicio Agrícola y Ganadero	–	Agricultural and Stockbreeding Service
Servicio Hidrográf. y Oceanográf. de Armada	–	Hydrograph. & Oceanograph. Service
Servicio Nacional de Pesca	–	National Fishery Service
Sistema de Evaluación de Impacto Ambiental	–	System of Envir. Impact Evaluation
Subsecretaría de Pesca	–	Sub-secretariat of Fishery

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Appendix 1

List of respondents

Adolfo Alvial	SalmonChile / Intesal	Managing director
Pedro Barboza	Servicio Nacional de Pesca	Department concessions
Jorge Bermúdez	Universidad Católica de Valparaíso	Chairgroup law
Marcelo Campos	Acuasesorías Ltda.	Lawyer
René Fuchslocher	Fuchslocher Abogados	Lawyer
Jorge Katz	Universidad de Chile	Chairgroup economics
Alejandra Lafon	Universidad Austral de Chile	Biologist
Robin Neill	University of Prince Edward Island	Chairgroup economics
Ricardo Norambuena	Subsecretaría de Pesca	Head of dep. aquaculture
Claudia Salazar	Subsecretaría de Pesca	Jurdical department
Gonzalo Silva	Technopress / Magazine Aqua	Editor
Jorge Soto	Universidad Austral de Chile	Chairgroup aquaculture
Osvaldo Urrutia	Subsecretaría de Pesca	Jurdical department
Marcelo Valenzuela	Acuasesorías Ltda.	Lawyer
Soledad Vásquez	Salmon Company Santa Cruz	Quality manager
Alfredo Wendt	Comisión Nacional del Medio Ambiente	Department SEIA

Appendix 2

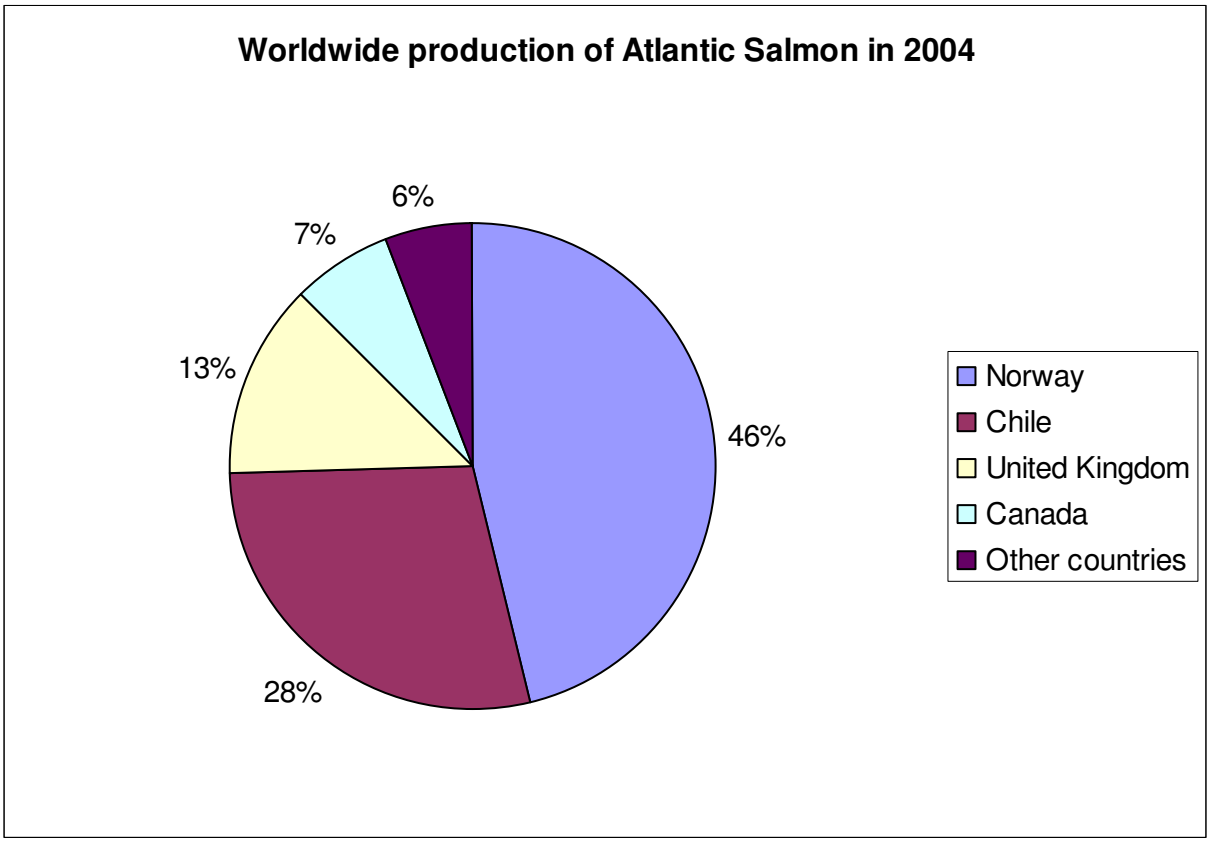
Aquaculture and Atlantic salmon production in 2004

	Aquaculture prod Metric Tonnes	Atlantic salmon prod Metric Tonnes	Atlantic salmon prod % from world	Atlantic salmon prod % of nat aquaculture	Aquaculture prod 1,000 US$	Aquaculture prod % from total	Atlantic salmon prod 1,000 US$	Value atlantic salmon (US$) % from world
Norway	637.993	565.902	46	89	1.688.202	2	1.472.318	36
Chile	694.693	346.956	28	50	2.814.837	4	1.526.606	37
United Kingdom	207.203	158.099	13	76	593.299	1	474.297	12
Canada	145.018	82.374	7	57	398.907	1	253.705	6
Other countries	57.715.093	71.540	6	0	64.804.755	92	347.519	9
Total	59.400.000	1.224.871	100		70.300.000	100	4.074.446	100

Source: FAO, 2005b

Appendix 3

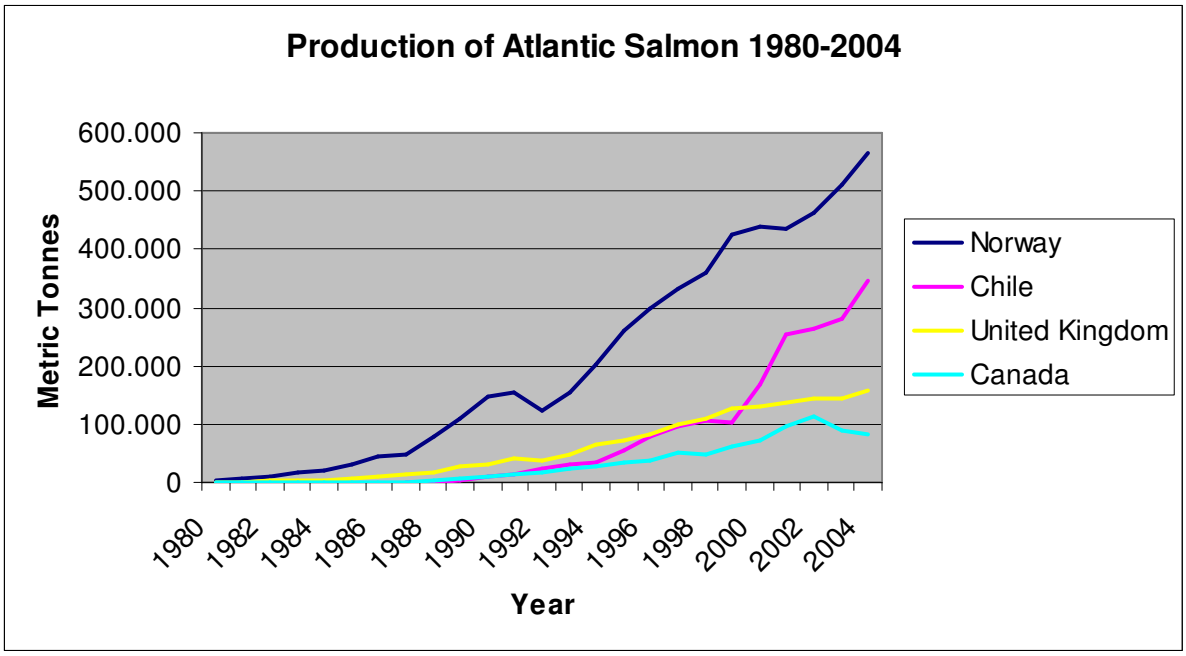
Worldwide production of Atlantic salmon in 2004



Source: FAO, 2005b

Appendix 4

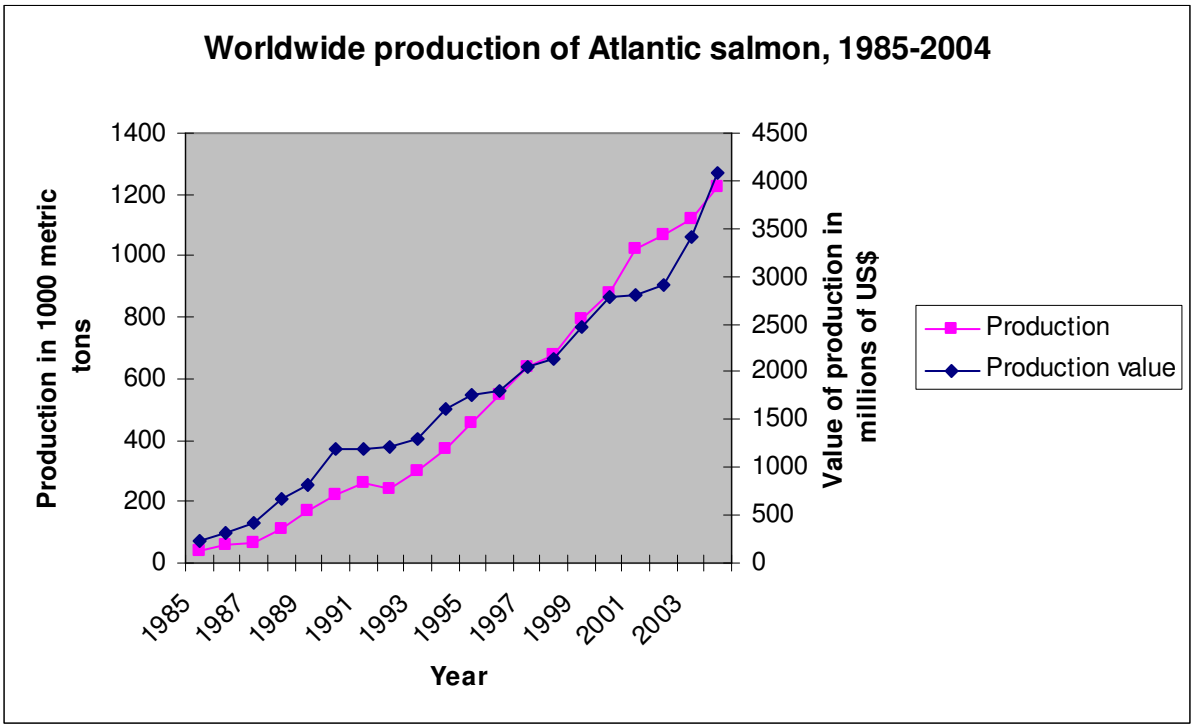
Production of Atlantic salmon per country, 1980-2004



Source: FAO, 2005b

Appendix 5

World production of Atlantic salmon, 1985-2004



Source: FAO, 2005b

Appendix 6

The Chicago Boys of the military regime

Sergio de Castro	Adviser to Ministry of Economic Affairs, Minister of Economic Affairs, Minister of Finance
Pablo Baraona	Adviser to Ministry of Agriculture, President of Central Bank, Minister of Economic Affairs, Minister of Mining
Avaro Bardón	CORFO official, President of Central Bank, Deputy Minister of Economic Affairs, President of Banco del Estado
Rold Lüders	Bi-Minister of Economic Affairs and Finance
Sergio de la Cuadra	President of Central Bank, Minister of Finance
Carlos Cáceres*	President of Central Bank, Minister of Finance, Minister of the Interior
Jorge Cauas*	Vice-president of Central Bank, Minister of Finance
Cristián Larroulet	Adviser to ODEPLAN, Chef de Cabinet at Ministry of Finance
Martín Costabal	Budget Director
Jorge Selume	Budget Director
Andrés Sanfuentes	Adviser to Central Bank, Adviser to Budget Agency
José Luís Zabala	Chief of Study Department, Central Bank
Juan Carlos Méndez	Budget Director
Alvaro Donoso	Minister Director of ODEPLAN
Alvaro Vial	Director of National Institute of Statistics (INE)
José Piñera	Minister of Labour, Minister of Mining
Felipe Lamarca	Director of Tax Agency (SII)
Hernán Büchi*	Banking Supervisor, Deputy Minister of Health, Minister Director of ODEPLAN, Minister of Finance
Alvaro Saieh	Adviser to Central Bank
Juan Villarzú	Budget Director
Joaquín Lavín	Adviser to ODEPLAN
Ricardo Silva	Chief of National Account, Central Bank
Juan Andrés Fontaine	Chief of Study Department, Central Bank
Julio Dittborn	Deputy Director of ODEPLAN
María Teresa Infante	Adviser to ODEPLAN, Deputy Minister of Social Security, Minister of Labour
Miguel Kast	Minister Director of ODEPLAN, Minister of Labour, Vice-president of Central Bank

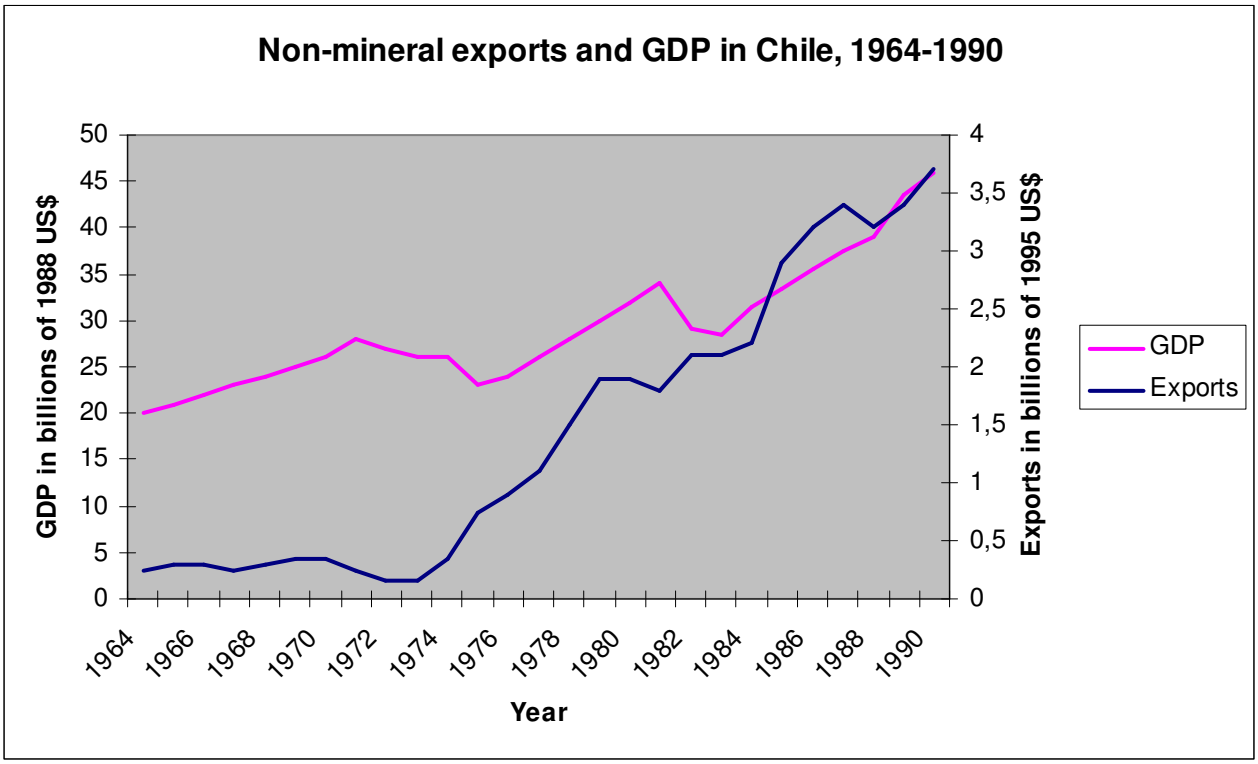
* These did not study in Chicago, but they are catalogued as Chicago Boys because of their total support for the Chicago approach and their active participation within the neoliberal economic team.

Source: Délano & Traslaviña, 1989:32-36 in Silva, 1991:391

Appendix 7

Non-mineral exports and GDP in Chile, 1964-1990

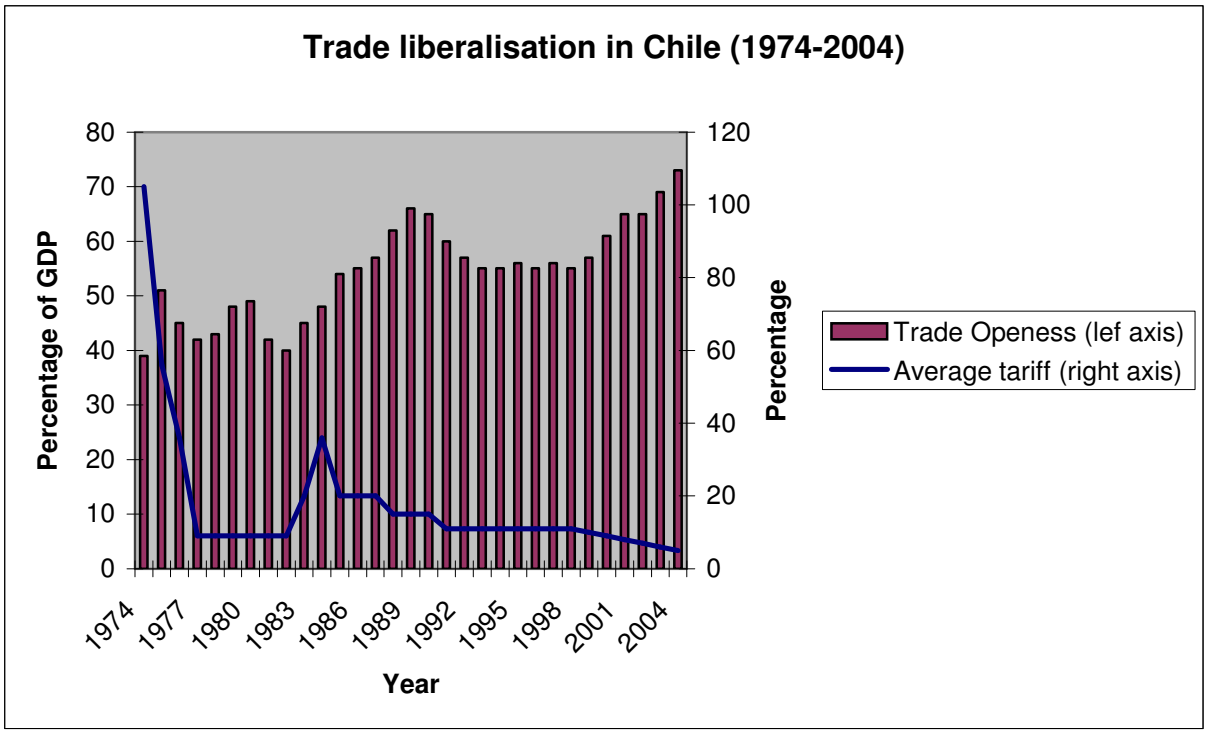
.



Source: Agosin, 1999:83

Appendix 8

Trade liberalisation in Chile, 1974-2004



Trade openness is calculated as the share of total trade (exports and imports) in GDP.

Source: Aninat et al., 2006:11